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NOISE MEASUREMENT FLIGHT TEST OF FIVE LIGHT HELICOPTERS

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13. ABSTRACT (Maximum 200 words)

The U.S. Department of Transportation, Federal Aviation Administration, (U.S.DOT/FAA), along with the U.S.DOT, Research and Special Programs Administration, Volpe National Transportation Systems Center (RSPA/Volpe Center) conducted a helicopter noise measurement flight test in Champaign, Illinois, during the period July 22 through 26, 1991. The primary objective of the study was to obtain the field data necessary to examine the feasibility of a simplified helicopter-noise-certification procedure (screening test). Acoustic data were measured by and stored on a hand-held sound-level meter (on-line processing) and recorded on digital tape for later off-line processing. A comparison of the measured on-line acoustic data with the acoustic data processed off-line provided the foundation necessary to evaluate the feasibility of the proposed screening test. In addition to acoustic measurements, meteorological data and helicopter tracking and performance data were also obtained.

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PREFACE

This document presents the results of a helicopter noise measurement flight test conducted in Champaign, Illinois by the U.S. Department of Transportation, Federal Aviation Administration (U.S.DOT/FAA), Office of Environment and Energy and the U.S.DOT, Research and Special Programs Administration, Volpe National Transportation Systems Center (RSPA/Volpe Center). Acoustic data were measured and processed by the Volpe Center's Acoustics Facility. The successful completion of this study hinged on the cooperation and performance of the following agencies:

Agency	Involvement
FAA, Office of Environment and Energy	Test Coordination
FAA, Rotorcraft Directorate	Reduction of altitude and aircraft speed data
Schweizer Aircraft Corporation	Provided Models 300 and 330, helicopters, pilots and maintenance crews
Enstrom Helicopter Corporation	Provided Models 280 FX and TH28 helicopters and pilots
Rotorway Aircraft, Inc.	Provided Model Exec 90 helicopter and pilots
United States Army Corps of Engineers, Construction Engineering Research Laboratory (CERL)	Video camera operation and five minute weather and aircraft speed data
Willard Airport Weather Station	Hourly Automated Terminal Information Service (ATIS) reports
Willard Airport Air Traffic Control Tower	Air Traffic Control
University of Illinois at Champaign	Provided test site

The authors would like to express their sincere thanks to these agencies for their dedication to this study.

METRIC/ENGLISH CONVERSION FACTORS

ENGLISH TO METRIC

LENGTH (APPROXIMATE)

1 inch (in) = 2.5 centimeters (cm)

1 foot (ft) = 30 centimeters (cm)

1 yard (yd) = 0.9 meter (m)

1 mile (mi) = 1.6 kilometers (km)

AREA (APPROXIMATE)

1 square inch (sq in, in^2 = 6.5 square centimeters (cm^2)

1 square foot (sq ft, ft^2 = 0.09 square meter (m$_2$)

1 square yard (sq yd, yd^2) = 0.8 square meter (m^2)

1 square mile (sq mi, mi^2) = 2.6 square kilometers (km^2)

1 acre = 0.4 hectares (he) = 4,000 square meters (m^2)

MASS - WEIGHT (APPROXIMATE)

1 ounce (oz) = 28 grams (gr)

1 pound (lb) = .45 kilogram (kg)

1 short ton = 2,000 pounds (lb) = 0.9 tonne (t)

VOLUME (APPROXIMATE)

1 teaspoon (tsp) = 5 milliliters (ml)

1 tablespoon (tbsp) = 15 milliliters (ml)

1 fluid ounce (fl oz) = 30 milliliters (ml)

1 cup (c) = 0.24 liter (1)

1 pint (pt) = 0.47 liter (1)

1 quart (qt) = 0.96 liter (1)

1 gallon (gal) = 3.8 liters (1)

1 cubic foot (cu ft, ft^3) = 0.03 cubic meter (m^3)

1 cubic yard (cu yd, yd^3) = 0.76 cubic meter (m^3)

TEMPERATURE (EXACT)

[(x-32)(5/9)] ^{o}F = y ^{o}C

METRIC TO ENGLISH

LENGTH (APPROXIMATE)

1 millimeter (mm) = 0.04 inch (in)

1 centimete. (cm) = 0.4 inch (in)

1 meter (m) = 3.3 feet (ft)

1 meter (m) = 1.1 yards (yd)

1 kilometer (km) = 0.6 mile (mi)

AREA (APPROXIMATE)

1 square centimeter (cm^2) = 0.16 square inch (sq in, in^2)

1 square meter (m^2) = 1.2 square yeards (sq yd, yd^2)

1 square kilometer (km^2) = 0.4 square mile (sq mi, mi^2)

1 hectare (he) = 10,000 square meters (m^2) = 2.5 acres

MASS - WEIGHT (APPROXIMATE)

1 gram (gr) = 0.036 ounce (oz)

1 kilogram (kg) = 2.2 pounds (lb)

1 tonne (t) = 1,000 kilograms (kg) = 1.1 short tons

VOLUME (APPROXIMATE)

1 milliliters (ml) = 0.03 fluid ounce (fl oz)

1 liter (1) = 2.1 pints (pt)

1 liter (1) = 1.06 quarts (qt)

1 liter (1) = 0.26 gallon (gal)

1 cubic meter (m^3) = 36 cubic feet (cu ft, ft^3)

1 cubic meter (m^3) = 1.3 cubic yards (cu yd, yd^3)

TEMPERATURE (EXACT)

[(9/5) y + 32] ^{o}C = x ^{o}F

QUICK INCH-CENTIMETER LENGTH CONVERSION

INCHES	0	1	2	3	4	5	6	7	8	9	10

CENTIMETERS 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 25.40

QUICK FAHRENHEIT-CELSIUS TEMPERATURE CONVERSION

^{o}F	-40^{o}	-22^{o}	-4^{o}	14^{o}	32^{o}	50^{o}	68^{o}	86^{o}	104^{o}	122^{o}	140^{o}	158^{o}	176^{o}	194^{o}	212^{o}
^{o}C	-40^{o}	-30^{o}	-20^{o}	-10^{o}	0^{o}	10^{o}	20^{o}	30^{o}	40^{o}	50^{o}	60^{o}	70^{o}	80^{o}	90^{o}	100^{o}

For more exact and or other conversion factors, see NBS Miscellaneous Publication 286, Units of Weights and Measures. Price $2.50. SD Catalog No. C13 10286.

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EXECUTIVE SUMMARY

This document presents the results of a helicopter noise measurement flight test conducted in Champaign, Illinois by the U.S. Department of Transportation, Federal Aviation Administration (U.S. DOT/FAA), Office of Environment and Energy and the U.S. DOT, Research and Special Programs Administration, Volpe National Transportation Systems Center (RSPA/Volpe Center). Acoustic measurements were performed on five light helicopters, as follows: the Schweizer Model 300 (in 7 design configurations), the Schweizer Model 330 (in 2 design configurations), the Rotorway Model Exec 90, the Enstrom Model 280 FX, and the Enstrom Model TH28. These measurements were performed to support the development of a light-helicopter "screening test" whereby an applicant can demonstrate compliance with current noise limits by means of a simpler, less expensive certification procedure as compared with the current procedure in FAR part 36, Appendix H.

In order to examine differences between the proposed screening test and the existing certification methodology, levels obtained by various methods were compared. The comparison of the sound exposure level (SEL) data shows that an operator-estimated SEL can be obtained in the field using a relatively inexpensive integrating sound level meter (SLM); and although the operator-estimated SEL tends to be slightly higher than the derived from tape recorded data (per Appendix H) SEL (on average 0.4 dBA), the difference rarely exceeds 1 dBA. Based on this comparison, it appears that light-helicopter noise certification can be performed with a relatively high degree of accuracy using a hand-held SLM.

At the December, 1991, International Civil Aviation Organization (ICAO) meeting held in Montreal, Canada, the Federal Aviation Administration used the results of this measurement study as the foundation for the official U.S. position on the subject of the proposed screening test. The position tendered by the FAA was that the proposed procedure is a viable alternative to the current light-helicopter noise certification procedure found in both FAR

Part 36 and ICAO, Annex 16[1] and that these documents should be modified accordingly.

Additional analyses are performed to determine if the least-squares regression model used to calculate the $\Delta 3$ source noise correction is influenced by the larger number of data points at the certification airspeed (six vs. two). The data suggested that the larger number of points at the target certification airspeed have little if any influence on the resulting regression model.

A supplementary analysis was performed to determine the effect of various design changes on the acoustic signatures of helicopters, using the data obtained from the two Schweizer helicopters. The noise reduction (both overall level and level in individual frequency bands) resulting from the addition of a muffler was fairly substantial, 3 - 4 dB for approach, and 6 - 8 dB for takeoff and sideline. The addition of a resonator resulted in a reduction in the noise levels for takeoff and level flyover and an increase in noise level for approach.

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[1] "International Standards and Recommended Practices, Environmental Protection," ANNEX 16 to the Convention on International Civil Aviation, Volume 1, Aircraft Noise, Second Edition, 1988.

1. INTRODUCTION

This document presents the results of a helicopter noise measurement flight test conducted in Champaign, Illinois by the U.S. Department of Transportation, Federal Aviation Administration (U.S. DOT/FAA), Office of Environment and Energy and the U.S. DOT, Research and Special Programs Administration, Volpe National Transportation Systems Center (RSPA/Volpe Center). Acoustic data were measured, processed, and analyzed by the Volpe Center's Acoustics Facility in Cambridge, Massachusetts.

1.1 BACKGROUND

The Federal Aviation Regulations, Part 36, "Noise Standards: Aircraft Type and Airworthiness Certification" (FAR Part 36),[1] establishes procedures for noise-certifying aircraft. A December, 1988 revision of FAR Part 36 included an amendment for noise certification of light (under 6000 lbs maximum takeoff weight) helicopters (Amendment 36-14, Effective 2/5/88). Since the noise signatures of rotary-wing aircraft are complex, the testing procedures required under this amendment can be correspondingly difficult to accomplish, and costly to perform. As a result, the FAA, in conjunction with the International Civil Aviation Organization (ICAO) is considering the development of a light-helicopter "screening test" whereby an applicant can demonstrate compliance with current noise limits by means of a simpler, less expensive certification procedure.

To this end, the FAA, Office of Environment and Energy, in conjunction with the Volpe Center's Acoustics Facility, the FAA's Rotorcraft Directorate and associated aircraft certification offices, the U.S. Army Corps of Engineers, and several U.S. helicopter manufacturers, arranged a helicopter-noise-measurement

[1] "Noise Standards: Aircraft Type and Airworthiness Certification," Federal Aviation Regulations, Part 36, Washington D.C.: Federal Aviation Administration, December 22, 1988.

study to be conducted at a test site in Champaign, Illinois during the period July 22 through 26, 1991.

1.2 OBJECTIVE

The objective of this study was to obtain the field data necessary to examine the feasibility of a simplified helicopter-noise-certification procedure, i.e., screening test.

1.3 TEST SITE

The test site chosen for measurements was located at a test facility belonging to the University of Illinois at Champaign, Illinois. The low ambient noise level, flat topography, availability of U.S. Army Corps of Engineers facilities, airport proximity and security of the area made this location desirable. The test site was essentially flat, covered with low-cut grass and bordered in all directions by fields of corn and soybeans. There was minimal interference from extraneous noise sources since traffic on area roadways was sparse and local aircraft were routed away from the test site by the Willard Airport traffic control tower.

The test site was located in a 1-mile-square tract bordered by roads running north-to-south and east-to-west. The helicopter flight-track was run parallel-to and halfway-between the two north-to-south running roads defining the bounds of the tract containing the test site. Figure 1-1 presents a plan view of the test site.

1.4 TEST HELICOPTER DESCRIPTIONS

Acoustic measurements were performed on five light helicopters, as follows: the Schweizer Model 300, the Schweizer Model 330, the Rotorway Model Exec 90, the Enstrom Model 280 FX, and the Enstrom Model TH28. The helicopters used in this measurement study were supplied by their respective manufacturers and flown by manufacturer-employed test pilots. Each helicopter

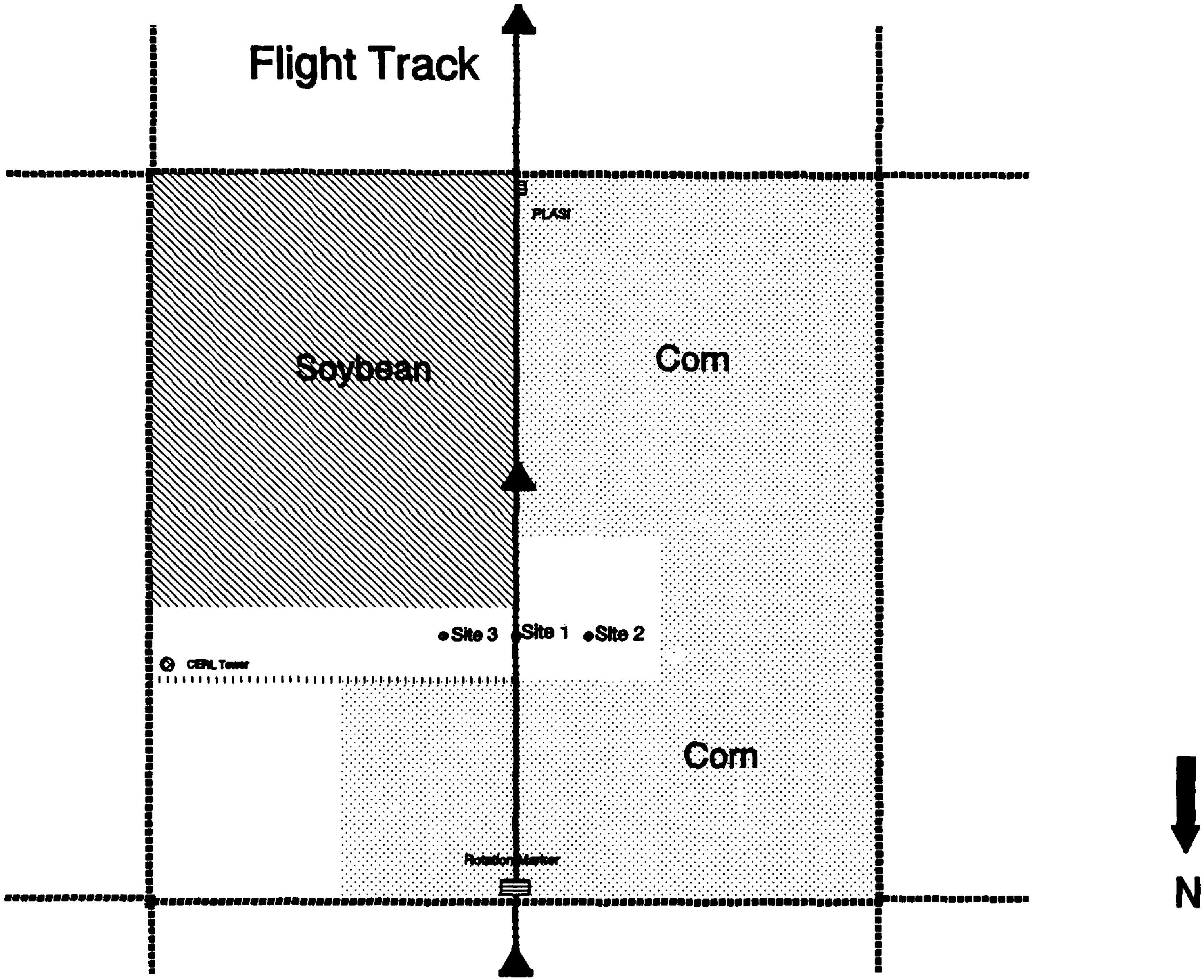


FIGURE 1-1. PLAN VIEW

was tested in its standard configuration. In addition, the two Schweizer models were tested in a variety of configurations, including various modified exhaust systems and tail rotor designs. These additional configurations were tested to simulate the effect of various acoustic signatures on the screening process. See Figures 1-2 through 1-6 for helicopter photos, summary specifications and reference flight parameters for each of the tested configurations.

CONFIGURATION A (STANDARD)

Engine:

Lycoming HIO-360-D1A

Exhaust System:

No Muffler

Weights:

Weight empty	474 kg (1046 lb)
Max Takeoff Weight	930 kg (2050 lb)

Rotor System:

	Main	Tail
Number of blades	3	2
Normal rpm	471	3094

External Dimensions:

Main rotor diameter	8.18 m (26 ft 10 in)
Tail rotor diameter	1.30 m (4 ft 4 in)
Length overall, rotors turning	9.40 m (30 ft 10 in)
Height overall	2.66 m (8 ft 8 5/8 in)

Performance:

Never-exceed speed at sea level	95 kts (175 km/h, 109 mph)
Max cruising speed at sea level (Vh)	80 kts (146 km/h, 91 mph)
Max rate of climb at sea level	228 m (750 ft)/min
Service ceiling	3048 m (10000 ft)
Hover ceiling	
IGE	1798 m (5900 ft)
OGE	840 m (2750 ft)

Reference Flight Parameters:

	Takeoff	Approach	Level Flyover (0.9Vh)
Ground Speed	40 (kts)	41 (kts)	72 (kts)
Climb Angle	10.46°	-6.00°	NA
Advancing Blade Tip Mach Number	NA	NA	.6898
Altitude at centerline-center	112.2 (m)	120.1 (m)	150 (m)

FIGURE 1-2. SCHWEIZER 300 - THREE-SEAT LIGHT-UTILITY HELICOPTER

CONFIGURATION B

Standard Configuration with the following exceptions:

Exhaust system:

Muffler installed

Performance:

Hover ceiling	
IGE	1732 m (5682 ft)

SCHWEIZER 300 - THREE-SEAT LIGHT-UTILITY HELICOPTER

CONFIGURATION C

Standard Configuration with the following exceptions:

Exhaust system:

Muffler installed

Rotor System:

	Main	Tail
Number of blades	3	4
Normal rpm	471	2321

Performance:

Hover ceiling	
IGE	1732 m (5682 ft)

SCHWEIZER 300 - THREE-SEAT LIGHT-UTILITY HELICOPTER

CONFIGURATION D

Standard Configuration with the following exceptions:

Exhaust System:

Muffler installed
Upward directed exhaust pipe

Rotor System:

	Main	Tail
Number of blades	3	4
Normal rpm	471	2321

Performance:

Hover ceiling	
IGE	1732 m (5682 ft)

FIGURE 1-2. SCHWEIZER 300 - THREE-SEAT LIGHT-UTILITY HELICOPTER (continued)

CONFIGURATION E

Standard Configuration with the following exceptions:

Exhaust System:

Muffler installed

Rotor System:

Tail rotor diameter	1.17 m (3 ft 10 in)

Performance:

Hover ceiling	
IGE	1732 m (5682 ft)

SCHWEIZER 300 - THREE-SEAT LIGHT-UTILITY HELICOPTER

CONFIGURATION F

Standard Configuration with the following exceptions:

Exhaust System:

Muffler installed
Resonator installed

Weights:

Max takeoff weight	921 kg (2030 lb)

Performance:

Max cruising speed at sea level	77 kts (141 km/h, 88 mph)
Hover ceiling	
IGE	1219 m (4000 ft)

Reference Flight Parameters:

	Takeoff	Approach	Level Flyover (0.9Vh)
Ground Speed	40 (kts)	41 (kts)	69 (kts)
Advancing Blade Tip Mach Number	NA	NA	.6855

FIGURE 1-2. SCHWEIZER 300 - THREE-SEAT LIGHT-UTILITY HELICOPTER (continued)

CONFIGURATION G

Standard Configuration with the following exceptions:

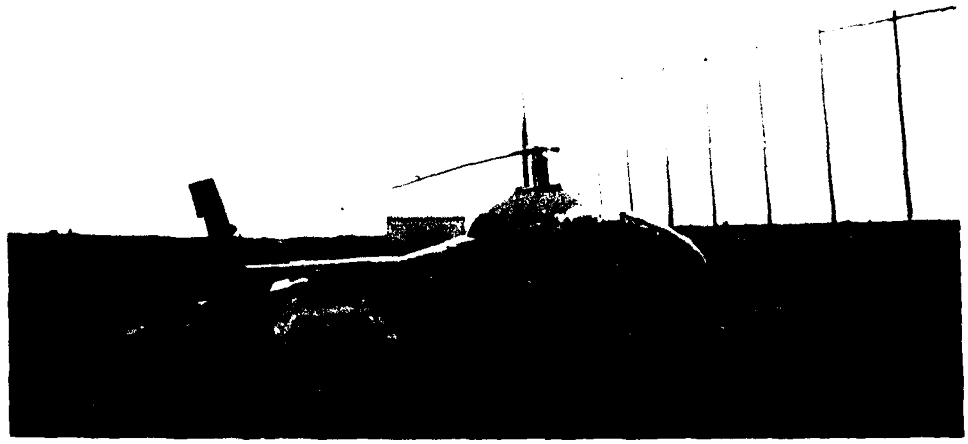
<u>Exhaust System:</u>

Muffler installed
Upward directed exhaust pipes

<u>Performance:</u>

Hover ceiling	
IGE	1732 m (5682 ft)

FIGURE 1-2. SCHWEIZER 300 - THREE-SEAT LIGHT-UTILITY HELICOPTER (continued)



CONFIGURATION H (STANDARD)

Engine:

Allison 250-C20 Turboshaft

Rotor System:

	Main	Tail
Number of blades	3	2
Normal rpm	471	3095

Weights:

Weight empty	476 kg (1050 lb)
Max Takeoff Weight	930 kg (2050 lb)

External Dimensions:

Main rotor diameter	8.18 m (26 ft 10 in)
Tail rotor diameter	1.30 m (4 ft 3 in)
Length overall, rotors turning	9.40 m (30 ft 10 in)
Height overall	2.64 m (8 ft 8 in)

Performance:

Never-exceed speed at sea level	100 kts (185 km/h, 115 mph)
Max cruising speed at sea level	91 kts (169 km/h, 105 mph)
Hover ceiling	
IGE	5485 m (18000 ft)
OGE	4265 m (14000 ft)

Reference Flight Parameters:

	Takeoff	Approach	Level Flyover (0.9Vh)
Ground Speed	49 (kts)	50 (kts)	94 (kts)
Climb Angle	14.29°	-6.00°	NA
Advancing Blade Tip Mach Number	NA	NA	.6898
Altitude at centerline-center	147.2 (m)	120.1 (m)	150 (m)

FIGURE 1-3. SCHWEIZER 330 - THREE-SEAT TURBINE-POWERED LIGHT HELICOPTER

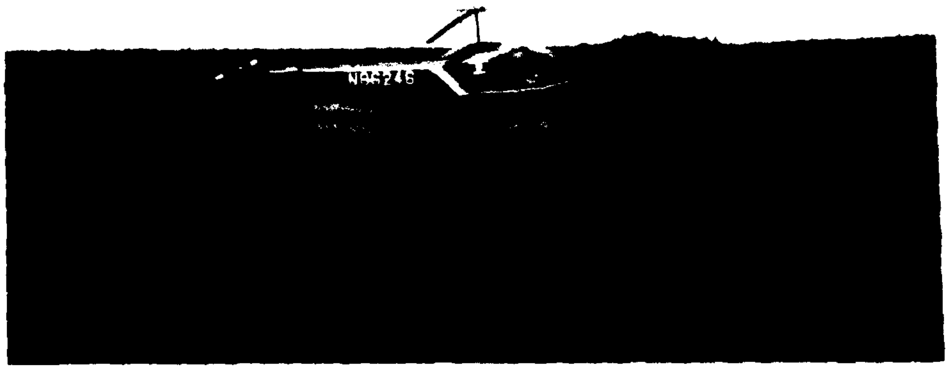
CONFIGURATION I

Same as in standard configuration except as follows:

Rotor System:

	Main	Tail
Number of blades	3	4

FIGURE 1-3. SCHWEIZER 330 - THREE-SEAT TURBINE-POWERED LIGHT HELICOPTER (continued)



Engine:

Textron Lycoming HIO-360-F1AD flat-four engine with Rotormaster 3BT5EE10J2 turbocharger

Rotor System:

	Main	Tail
Number of blades	3	2
Normal rpm	350	2709

Weights:

Weight empty	719 kg (1585 lb)
Max Takeoff Weight	1179 kg (2600 lb)

External Dimensions:

Main rotor diameter	9.75 m (32 ft)
Tail rotor diameter	1.42 m (4 ft 8 in)
Length overall, rotors stationary	8.92 m (23 ft 3 in)
Height to top of rotor head	2.79 m (9 ft 2 in)

Performance:

Never-exceed speed at sea level	102 kts (189 km/h, 117 mph)
Max cruising speed at sea level	102 kts (188 km/h, 117 mph)
Max Rate of Climb at Sea Level	442 m/min (1450 ft/min)
Certificated Operating Ceiling	3660 m (1200 ft)
Hover ceiling	
IGE	2345 m (7700 ft)
OGE	2650 m (8700 ft)
Maximum Range	260 nm (483 km, 300 miles)

Reference Flight Parameters:

	Takeoff	Approach	Level Flyover (0.9Vh)
Ground Speed	48 (kts)	50 (kts)	90 (kts)
Climb Angle	11.30°	-6.00°	NA
Advancing Blade Tip Mach Number	NA	NA	.6503
Altitude at centerline-center	119.8 (m)	120.1 (m)	150 (m)

FIGURE 1-4. ENSTROM 280 FX - THREE-SEAT LIGHT HELICOPTER

Engine:

Allison 250-C20W Turboshaft

Rotor System:

	Main	Tail
Number of blades	3	2

Weights:

Weight empty	671 kg (1480 lb)
Max Takeoff Weight	1202 kg (2650 lb)

External Dimensions:

Main rotor diameter	9.75 m (32 ft)
Tail rotor diameter	1.42 m (4 ft 8 in)
Length overall, rotors stationary	8.92 m (23 ft 3 in)
Height to top of rotor head	2.90 m (9 ft 6 in)

Performance:

Never-exceed speed at sea level	[illegible] km/h, 142 mph)
Max cruising speed at sea level	[illegible] km/h, 126 mph)
Max Rate of Climb at Sea Level	[illegible] ft/min)
Service Ceiling	[illegible] ft)
Hover ceiling	
IGE	[illegible] (10400 ft)
OGE	[illegible] (4200 ft)
Maximum Range	[illegible] 76 km, 420 miles)

Reference Flight Parameters:

	Takeoff	Approach	Level Flyover (0.9Vh)
Ground Speed	55 (kts)	55 (kts)	90 (kts)
Climb Angle	12.97°	-6.00°	NA
Advancing Blade Tip Mach Number	NA	NA	.6503
Altitude at centerline-center (m)	135.0 (m)	[illegible] (m)	150 (m)

FIGURE 1-5. ENSTROM TH-28 - THREE-SEAT TURBINE-POWERED LIGHT HELICOPTER

Engine:

Rotorway RW-152D

Weights:

Weight empty	376 kg (830 lb)
Max Takeoff Weight	599 kg (1320 lb)

Rotor System:

	Main	Tail
Number of blades	2	2

External Dimensions:

Main rotor diameter	7.72 m (25 ft 4 in)
Length of Fuselage	6.53 m (21 ft 5 in)
Height to top of Main Rotor	2.13 m (7 ft)

Performance at max takeoff weight:

Never-exceed and max level speed	100 kts (185 km/h, 115 mph)
Normal Cruising Speed	82 kts (153 km/h, 95 mph)
Max Rate of Climb at Sea Level	366 m/min (1200 ft/min)
Service Ceiling	3660 m (12000 ft)
Hover ceiling, with two persons	
IGE	2285 m (7500 ft)
OGE	1370 m (4500 ft)
Maximum Range	174 nm (323 km, 201 miles)

Reference Flight Parameters:

	Takeoff	Approach	Level Flyover (0.9Vh)
Ground Speed	52 (m)	52 (m)	82 (m)
Climb Angle	5.45°	-6.00°	NA
Advancing Blade Tip Mach Number	NA	NA	.5892
Altitude at centerline-center	67.4 (m)	120.1 (m)	150 (m)

FIGURE 1-6. ROTORWAY EXEC 90 - TWO-SEAT HOME-BUILT HELICOPTER

2. MEASUREMENT INSTRUMENTATION

2.1 ACOUSTIC MEASUREMENT INSTRUMENTATION

This Section describes the acoustic measurement instrumentation employed in this study. A block diagram of this instrumentation is shown in Figure 2-1.

Each acoustic measurement system consisted of a General Radio Model 1962-9610 random incidence electret microphone connected to a General Radio Model 1560-P42 preamplifier. The microphone\ preamplifier system was mounted on a tripod and positioned for grazing incidence at a height of 4 feet (1.2 m) above the ground (measured from the microphone diaphragm). A Brüel and Kjær Model UA0237 windscreen was placed atop each microphone to reduce the effects of wind-generated noise on the microphone diaphragm. The acoustic signal measured by the microphone/preamplifier assembly was fed through 200 feet of cable to both a digital recording system, and an on-line processing system.

2.1.1 Digital Recording System

Each digital recording system consisted of a JVC Model BR-6200U video cassette recorder (VCR) and a Sony Model PCM-F1 digital audio processor (PCM-F1). The acoustic signal from the microphone/preamplifier was low-pass filtered (22 kHz anti-alias filter), digitized at a rate of 44.056 kHz and recorded on video channels 1 and 2 with a 10 dB gain offset between channels. Recorder gains were set using a fixed-step conditioning amplifier and fine tuned during calibration using the variable gain adjustment on the PCM-F1. Careful setting of recorder gain insured that the best possible signal-to-noise ratio was achieved, while allowing enough headroom to comply with applicable distortion avoidance requirements.

The output from a Datum Model 9300 Irig-B time code generator, synchronized to a single universal time base was recorded on audio channel 2 of each VCR. Pertinent test-run information was voice-annotated and recorded on audio channel 1.

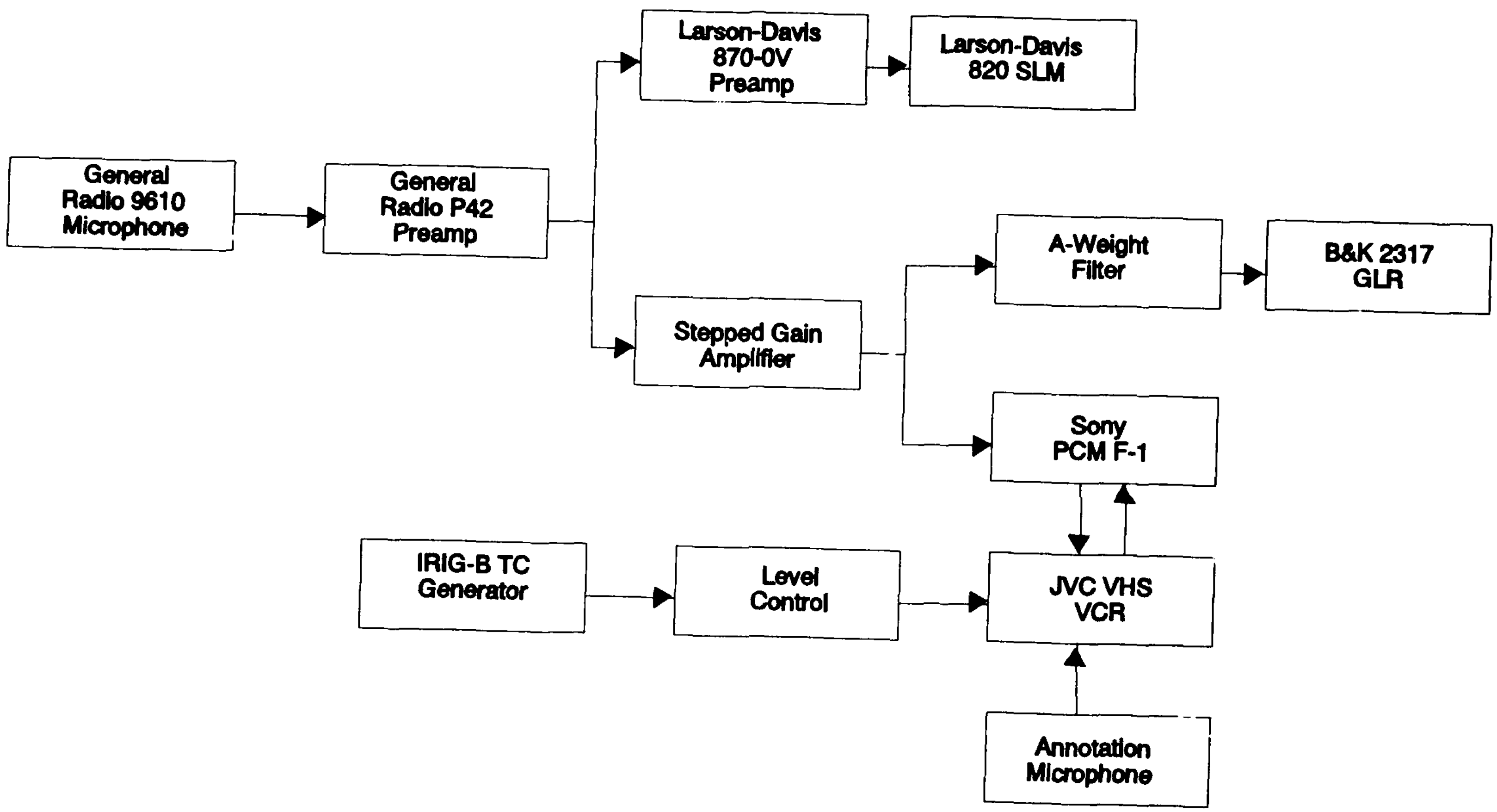


FIGURE 2-1. ACOUSTIC MEASUREMENT SYSTEM

2.1.2 On-Line Processing System

Each on-line processing system consisted of a Larson Davis Model 820 Type 1 Precision Integrating Sound Level Meter/ Environmental Noise Analyzer (LD 820) and a Brüel and Kjær Model 2317 Graphic Level Recorder (GLR). The acoustic signal from the microphone/preamplifier system was fed directly into the LD 820. The same acoustic signal was externally A-weighted prior to being input to the GLR.

The LD 820 was programmed to measure, and to internally A-weight and store the noise level time history (slow sound level meter response characteristics), one data record each ½-second. In addition, each LD 820 was set to compute and store the single event Sound Exposure Level (SEL, over the period defined by the system operator), the maximum A-weighted sound level (L_{Amax}), and the duration of each noise event. For the purposes of this study, these parameters were stored in the internal memory of the LD 820 and were downloaded at the end of each measurement day to an AST Premium Exec Model 386SX/20 notebook computer and stored on floppy disk for later offline processing. Note: the LD 820 has been updated since this study to allow for on-line access to the SEL, the L_{Amax}, and the duration of each noise event directly from the front-panel display.

The GLR was set at a paper transport speed of 0.3 mm/s (0.118 in/s) and produced a graphic time-history recording (A-weighted level versus time). This time history served as on- site visual verification of the acoustic integrity of each test run and aided the system operators in defining the measurement period for the SEL calculation.

2.2 METEOROLOGICAL MEASUREMENT INSTRUMENTATION

This Section provides a description of the meteorological data acquisition systems.

2.2.1 On-Site Weather Station

A Climatronics Model EWS weather station was deployed at the test site to measure and continuously record temperature, relative humidity, wind speed and direction. Wind speed and direction were measured at a height of 10 feet above the ground; temperature and relative humidity were measured at a height of 8 feet above the ground. Readings were recorded in graphical form on a continuous strip chart. Supplemental temperature and humidity readings were also collected using a sling psychrometer.

2.2.2 CERL Weather Station

The weather tower, manned by CERL personnel, was located approximately ¼-mile east of the centerline microphone (see Figure 1-1). Personnel at the tower recorded temperature, wind speed and wind direction at 5-minute intervals during each test day. Temperature sensors were located at heights of 13, 35, and 108 feet above the ground; while a wind speed and wind direction sensor was positioned at a height of 115 feet.

2.2.3 Willard Airport Weather Station

Hourly Automated Terminal Information Service (ATIS) reports were obtained from Willard Airport and used to supplement the on-site meteorological data. These reports contained ambient temperature, dew point, and barometric pressure. The meteorological station at Willard Airport was located approximately 5 miles east of the test site.

2.3 ALTITUDE MEASUREMENT AND GUIDANCE INSTRUMENTATION

Helicopter altitude and lateral deviation (relative to the reference flight track) were recorded using a pair of synchronized still cameras. One camera was situated approximately 1000 feet west of the centerline microphone to record helicopter position and altitude at centerline overhead. The other was positioned along the flight path approximately 1000 feet south of the centerline microphone to record lateral deviation at centerline overhead. A

graduated scale was placed 50 feet in front of each camera and used for photo scaling purposes. Helicopter approach was guided by a pulsed light approach slope indicator (PLASI). The PLASI was specially modified to produce five indication signals to help guide the pilot along a 6-degree approach path.

3. EXPERIMENTAL APPROACH

3.1 MICROPHONE LOCATIONS

Three microphones were deployed as specified in FAR Part 36, Appendix H. One microphone was placed at the centerline position, directly under the north-to-south flight track (Site 1). A second microphone was placed 150 m due west of the centerline microphone (Site 2) and the third microphone was placed 150 m due east of the centerline microphone (Site 3). The grass within a 10-foot radius around each microphone was cut to a height of less than ½-inch to minimize the effects of absorption on the ground reflected sound path (FAR Part 36, Section H36.101(b)).

3.2 NOISE MEASUREMENT SYSTEM CHECKOUT

At the beginning of each measurement day, a complete system checkout was performed on each acoustic measurement system. To establish the electronic noise floor of each system, a passive microphone simulator (dummy microphone) was substituted for each microphone. In addition, the frequency response of each system was obtained by recording a 30-second sample of pink noise from a Cetec Ivie Model IE-20B random noise generator. General Radio Model 1562-A acoustic calibrators with an output sound pressure level of 114 dB *re* 20 μPa were used to calibrate the acoustic measurement systems at the start of each test day. Subsequent calibrations were performed at hourly intervals during the day and a final calibration was performed at the end of each measurement day.

To insure conformity between the three acoustic measurement sites, the time code generator (TCG) at each site was synchronized to a single universal time base. All other timekeeping instruments, e.g. stop watches (See Section 3.4.1), were then synchronized to the TCGs.

3.3 TEST SERIES DESCRIPTION

A communications network was utilized to manage the flight crews and the various data acquisition teams. This network used three 2-way walkie-talkie-based systems coordinated at the central command center (CCC), located approximately 200 feet southeast of the centerline microphone. Communication System 1 linked the CCC with the three Volpe Center acoustic measurement teams. System 2 linked the CCC with the helicopter cockpit crew, ground maintenance crews and the Willard Airport control tower. System 3 linked the CCC with the aircraft positioning team and the CERL acoustics laboratory.

Following checkout and calibration of the measuring systems, the test director at the CCC instructed the helicopter cockpit crew to proceed with the flight tests. During a typical flight test, the acoustic measurement coordinator would, at the appropriate time, instruct the system operators at Sites 1, 2 and 3 to begin simultaneous recordings of acoustic data on the digital recording systems and the GLRs. The decision to begin measuring acoustic data for the on-line SEL measurements (using the LD 820s) was left up to the individual system operators at each site. Each operator was instructed to capture the leading and trailing 10 to 15 dB down points of the acoustic signature of the test run based on the A-weighted noise level versus time history trace on the GLR chart recording. Following each test run, the GLR time history plots were used to determine the acoustic integrity of each individual flight test. Rejected tests were rerun, as appropriate.

A complete set of measurements for each helicopter consisted of takeoff, approach, and level flyovers, per Appendix H of FAR Part 36. Note: level flyover tests were performed at multiple airspeeds so that a source noise correction could be computed (see Section 4.2.3). Tables 3-1 through 3-5 present a test summary for the 5-day measurement study. In reviewing these Tables, note the following:

- LFO, 492', XV_h - denotes a level flyover event at an altitude of 492 ft and a speed of XV_h (Test Series A and D).

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TABLE 3-1. TEST SUMMARY, JULY 22, 1991

Test Series/ Run Numbers	Description of Test Series	Start Time	Stop Time
	***** Schweizer 300, Configuration A *****		
A/A1-A6	LFO, 492', $0.9V_h$	08:15	08:33
D/D1-D2	LFO, 492', $1.0V_h$	08:34	08:39
D/D3-D6	LFO, 492', $0.8V_h$	08:40	08:53
D/D7-D8	LFO, 492', $0.7V_h$	09:24	09:30
D/D9-D10	LFO, 492', $0.6V_h$	09:32	09:39
B/B1-B6	6° Approach, V_y	09:40	10:08
C/C1-C9	10.46° Takeoff, V_y	10:31	11:10
	***** Rotorway Exec 90 *****		
A/A1-A5,A9	LFO, 492', $0.9V_h$	11:40	11:50
D/D6-D7	LFO, 492', $1.0V_h$	11:51	11:54
D/D8	LFO, 492', $0.8V_h$	11:56	11:58
D/D10	LFO, 492', $0.8V_h$	12:27	12:29
D/D11-D12	LFO, 492', $0.7V_h$	12:29	12:33
D/D13-D14	LFO, 492', $0.6V_h$	12:34	12:39
B/B15-B21	6° Approach, V_y	12:41	13:50
C/C22-C27	5.45° Takeoff, V_y	13:52	14:10
	***** Schweizer 300, Configuration B *****		
A/A1-A6	LFO, 492', $0.9V_h$	14:58	15:15
D/D7-D8	LFO, 492', $1.0V_h$	15:16	15:20
D/D9-D10	LFO, 492', $0.8V_h$	15:24	15:27
D/D11-D12	LFO, 492', $0.7V_h$	15:28	15:32
D/D13-D14	LFO, 492', $0.6V_h$	15:34	15:39
B/B15-B20	6° Approach, V_y	16:08	16:33
C/C21-C28	10.46° Takeoff, V_y	16:36	17:06

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TABLE 3-2. TEST SUMMARY, JULY 23, 1991

***** Schweizer 300, Configuration C *****

Test Series/ Run Numbers	Description of Test Series	Start Time	Stop Time
A/A1-A7	LFO, 492', $0.9V_h$	06:40	06:58
D/D8-D9	LFO, 492', $1.0V_h$	06:59	07:02
D/D10-D11	LFO, 492', $0.8V_h$	07:03	07:07
D/D12-D13	LFO, 492', $0.7V_h$	07:09	07:14
D/D14-D16	LFO, 492', $0.6V_h$	07:15	07:25
B/B17-B24	6° Approach, V_y	07:45	08:12
C/C25-C30	10.46° Takeoff, V_y	08:13	08:33

***** Schweizer 330, Configuration H *****

Test Series/ Run Numbers	Description of Test Series	Start Time	Stop Time
A/A1-A7	LFO, 492', $0.9V_h$	09:27	09:44
D/D8-D9	LFO, 492', $1.0V_h$	09:45	09:49
D/D10-D11	LFO, 492', $0.8V_h$	09:50	09:55
D/D12-D13	LFO, 492', $0.7V_h$	09:56	09:59
D/D14-D15	LFO, 492', $0.6V_h$	10:00	10:04
B/B16-B22	6° Approach, V_y	10:28	10:48
C/C23-C34	14.29° Takeoff, V_y	10:50	12:00

***** Schweizer 300, Configuration D *****

Test Series/ Run Numbers	Description of Test Series	Start Time	Stop Time
A/A1-A6	LFO, 492', $0.9V_h$	12:41	12:55
D/D7-D9	LFO, 492', $1.0V_h$	12:57	13:04
D/D10-D11	LFO, 492', $0.8V_h$	13:06	13:10
D/D12-D13	LFO, 492', $0.7V_h$	13:11	13:16
D/D14-D15	LFO, 492', $0.6V_h$	13:18	13:23
B/B16-B23	6° Approach, V_y	13:49	14:18
C/C24-C29	10.46° Takeoff, V_y	14:21	14:45

TABLE 3-3. TEST SUMMARY, JULY 24, 1991

***** Schweizer 300, Configuration E *****

Test Series/ Run Numbers	Description of Test Series	Start Time	Stop Time
A/A1-A6	LFO, 492', $0.9V_h$	06:28	06:42
D/D7-D8	LFO, 492', $1.0V_h$	06:44	06:49
D/D9-D10	LFO, 492', $0.8V_h$	06:50	06:54
D/D11-D12	LFO, 492', $0.7V_h$	06:55	07:00
D/D13-D14	LFO, 492', $0.6V_h$	07:01	07:08
B/B15-B20	6° Approach, V_y	07:36	07:57
C/C21-C24	10.46° Takeoff, V_y	07:59	08:12
	330 Test		
E/E1-E7	10.46° Takeoff, V_y	11:44	12:09

***** Schweizer 330, Configuration I *****

Test Series/ Run Numbers	Description of Test Series	Start Time	Stop Time
A/A1-A6	LFO, 492', $0.9V_h$	09:08	09:26
D/D7-D8	LFO, 492', $1.0V_h$	09:27	09:31
D/D9-D10	LFO, 492', $0.8V_h$	09:34	09:38
D/D11-D12	LFO, 492', $0.7V_h$	09:39	09:43
D/D13-D14	LFO, 492', $0.6V_h$	09:44	09:49
B/B15-B21	6° Approach, V_y	10:07	10:32
C/C22-C27	14.29° Takeoff, V_y	10:33	10:53

TABLE 3-4. TEST SUMMARY, JULY 25, 1991

***** Schweizer 300, Configuration F *****

Test Series/ Run Numbers	Description of Test Series	Start Time	Stop Time
A/A1-A7	LFO, 492', $0.9V_h$	06:39	06:59
D/D8-D9	LFO, 492', $1.0V_h$	07:01	07:04
D/D10-D11	LFO, 492', $0.8V_h$	07:08	07:13
D/D12-D13	LFO, 492', $0.7V_h$	07:15	07:19
D/D14-D15	LFO, 492', $0.6V_h$	07:21	07:26
B/B16-B23	6° Approach, V_y	07:51	08:24
C/C24-C31	10.46° Takeoff, V_y	08:26	08:50

***** Schweizer 300, Configuration G *****

Test Series/ Run Numbers	Description of Test Series	Start Time	Stop Time
A/A1-A7	LFO, 492', $0.9V_h$	09:41	09:59
D/D8-D9	LFO, 492', $1.0V_h$	10:01	10:05
D/D10-D11	LFO, 492', $0.8V_h$	10:07	10:10
D/D12-D13	LFO, 492', $0.7V_h$	10:12	10:16
D/D14-D15	LFO, 492', $0.6V_h$	10:18	10:23
B/B16-B24	6° Approach, V_y	10:47	11:20
C/C25-C30	10.46° Takeoff, V_y	11:22	11:45

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TABLE 3-5. TEST SUMMARY, JULY 26, 1991

Test Series/ Run Numbers	Description of Test Series	Start Time	Stop Time
	***** Enstrom Th28 *****		
B/BT1-BT7	6° Approach, V_y	06:28	06:56
	***** Enstrom 280FX *****		
B/BP8-BP14	6° Approach, V_y	07:08	07:37
	***** Enstrom TH28 *****		
C/CT15-CT21	12.97° Takeoff, V_y	07:56	08:29
	***** Enstrom 280FX *****		
C/CP22-CP27	11.30° Takeoff, V_y	08:44	09:10
	***** Enstrom TH28 *****		
A/AT28-AT33	LFO, 492', $0.9V_h$	10:15	10:34
D/DT34-DT35	LFO, 492', $1.0V_h$	10:35	10:39
D/DT36-DT37	LFO, 492', $0.8V_h$	10:40	10:47
D/DT38-DT39	LFO, 492', $0.7V_h$	10:49	10:54
D/DT40-DT41	LFO, 492', $0.6V_h$	10:59	11:07
	***** Enstrom 280FX *****		
A/AP42-AP47	LFO, 492', $0.9V_h$	12:46	13:01
D/DP48-DP49	LFO, 492', $0.8V_h$	13:03	13:07
D/DP50-DP52	LFO, 492', $0.7V_h$	13:09	13:18
D/DP53-DP54	LFO, 492', $0.6V_h$	13:21	13:26
D/DP55-DP57	LFO, 492', $0.6V_h$	13:29	13:41

- *6° Approach, V_y* - denotes an approach event at a reference glide slope of 6° and at a speed of V_y (Test Series B).

- *X° Takeoff, V_y* - denotes a takeoff event at a reference takeoff angle of X° and at a speed of V_y (Test Series C).

3.4 ADDITIONAL MEASUREMENT COMPONENTS

3.4.1 Helicopter Speed Determination

Helicopter ground speed was measured by an observer equipped with a stopwatch in the CERL weather tower, 2500 feet from the flight track. The observer used the vertical frames of the picture window in the tower to make visual alignment with fixed reference points on the flight track. By measuring the split time during which the helicopter passed between the vertical posts and the geometry of the reference triangulation, ground speed was determined.

3.4.2 Flight Path Markers and Guidance Systems

A number of methods were used to aid the helicopter pilots in maintaining the correct flight profile:

1. Visual cues in the form of bright blue squares were placed along the flight path common to all flight profiles.

2. A rotation marker was placed beneath the flight track, 1640 feet north of the centerline microphone to identify the takeoff rotation point.

3. A pulsed light approach slope indicator (PLASI) was placed approximately 3750 feet south of the centerline microphone at the intersection of the 6-degree approach slope and the ground. The PLASI generated light rays crossed over the centerline microphone at an altitude of 394 feet above ground level. The PLASI was specially modified to produce 5 indication signals to help guide the pilot along a 6-degree approach path, as follows:

   - A solid white signal indicated the helicopter was on the flight path.

- A solid red signal indicated the helicopter was slightly below the flight path.

- A pulsating red signal indicated the helicopter was below the allowed ½-degree deviation.

- A solid green signal indicated the helicopter was slightly above the flight path.

- A pulsating green signal indicated the helicopter was above the allowed ½-degree deviation.

Utilizing the aforementioned visual guidance, the pilots adjusted their glide slopes as appropriate, keeping the flight path within the 6 degree wedge (±½ degree) defining the target approach track.

3.4.3 Cockpit Observer Log

Pertinent helicopter performance parameters such as indicated airspeed, altitude, engine & rotor RPM, and outside air temperature were recorded by an observer on board the test helicopter at the centerline overhead position. Time of overhead was transmitted by radio from the CCC in the form of a verbal "mark."

4. DATA REDUCTION

This Section describes the procedures used to arrive at the acoustic data sets found in the Appendices A through D. Data reduction followed the principals outlined in FAR Part 36, Appendix H and Advisory Circular AC 36-4B.[2]

4.1 DIGITALLY RECORDED DATA

Digital tape recordings were analyzed at the Volpe Center's Acoustics Facility in Cambridge, Massachusetts. Figure 4-1 is a block diagram of the acoustic data analysis instrumentation. The recorded data were reproduced and fed through a Brüel and Kjær Model 2131 digital ⅓-octave frequency analyzer (B&K 2131) and averaged into ½-second linear data records. The start and duration of each processed event was identified by first listening to the recorded data to insure that no extraneous sounds contaminated the data to be analyzed (listening/screening process). Using the time code signal recorded on audio channel one of the tape, and the coincidence circuit of a Datum Model 9300 time code reader, the data reduction system was triggered to begin processing at the precise instant identified during the listening/screening process. One-half second records of ⅓-octave band sound pressure levels (25 Hz - 10 kHz) were linearly averaged and digitized by the B&K 2131 and stored in contiguous fashion in computer data files over the operator-specified duration.

Also processed and stored in separate files were ½-second records of recorded calibration signals, pink noise signals and ambient data. System gain and calibration adjustments were applied to the stored data, as required. Time-of-day was assigned to the midpoint of each ½-second data record based upon the start time at the onset of the event and the index number assigned to each data record.

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[2] "Noise Certification Handbook", Advisory Circular, AC 36-4B, Washington D.C.: Federal Aviation Administration, March 23, 1988.

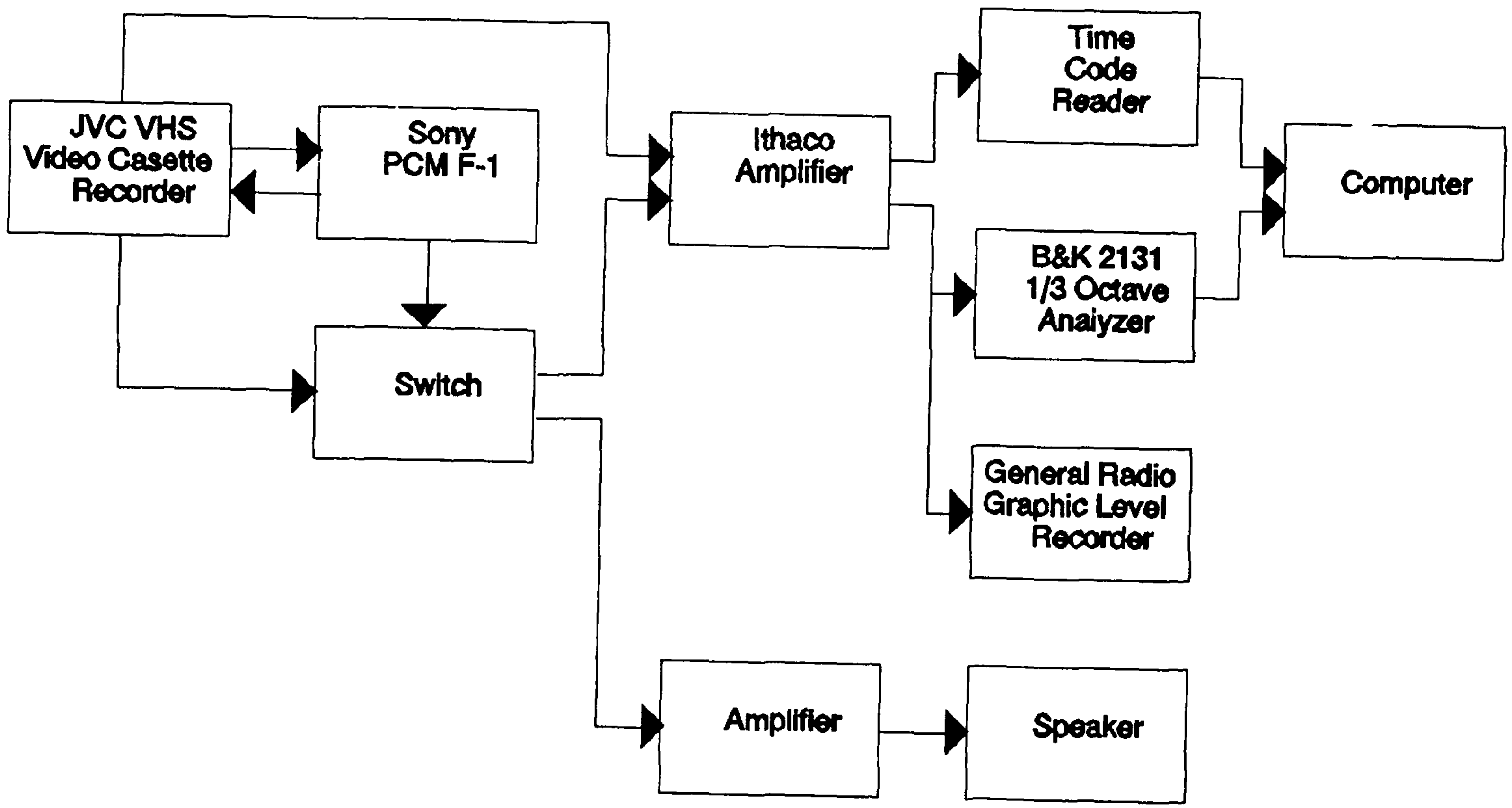

FIGURE 4-1. ACOUSTIC DATA ANALYSIS INSTRUMENTATION

The propagation distances and position coordinates (x,y,z) of the helicopter at the time of emission of each ½-second data record were computed utilizing the measured tracking data (see Appendix G), time at overhead, and the average temperature data over the propagation path (see Appendix F).

4.1.1 Ambient Noise

The lowest sound pressure level measured during a flight test is limited by the background noise level. The background noise level is a function of both ambient noise level at the test site and the electronic noise floor of the data measuring and analysis system. Representative ambient data were obtained from a 5-to-10 second time-averaged sample of data recorded prior to each event. The ambient noise level was compared against the noise floor of the B&K 2131, using the +1 dB criterion (FAR Part 36, Section H36.109). Ambient data which did not meet this criterion were identified as masked. The unmasked ⅓-octave band ambient levels were used to correct the measured raw spectral data from each event by subtracting the ambient levels from the measured levels on an energy basis. The following exceptions to this procedure are noted:

1. The ⅓-octave spectral data were tested for masking against the analyzer noise floor prior to being corrected for ambient (+1 dB criterion). Any ⅓-octave band level failing the test was identified as masked and was not adjusted for ambient. Any data record with four or more masked bands below 800 Hz or with masked bands occurring in the 800, 1000, or 1250 Hz band was judged bad.

2. Each ⅓-octave frequency band below 800 Hz was further tested and adjusted according to the following: If the measured level was less than the ambient +5 dB criterion, the measured level was set equal to the ambient level.

3. If the measured level in any ⅓-octave frequency band, 800 Hz or above, was less than the ambient +5 dB criterion, the measured level was identified as masked and adjusted by spectral shaping (see Section 4.1.3).

4. If an erroneous sound, e.g., a bird chirp, was identified in a particular ⅓-octave frequency band, the measured level in that band was replaced by a level obtained

through linear interpolation of the ⅓-octave band levels adjacent to the contaminated frequency band.

The above process yielded the ambient corrected spectral data.

4.1.2 Frequency Response Adjustments

Utilizing a 30-second energy-averaged portion of the recorded pink noise signal, adjustments were made to the unmasked portion of the ambient corrected raw spectral data. This adjustment was made to account for deviations in the frequency response of the acoustic measurement and reproduction system.

4.1.3 Spectral Shaping

Data records with up to seven masked high frequency bands (2.5 kHz and above) were further adjusted by extrapolating from the level of the highest unmasked frequency band to the next consecutive band by an amount equal to the difference between the reference day and test day atmospheric absorption along the sound propagation path from source to receiver. If more than seven bands were identified as masked, the data record was judged bad.

Records within 1 second of and including the maximum tone-corrected perceived noise level ($PNLT_{max}$) were similarly reshaped but were limited to having a maximum of four masked bands. If more than four masked bands were identified the entire event was discarded.

Adjustments as above yielded a contiguous set of linear ½-second data records for each event.

4.1.4 Simulation of a Slow Exponential Time Constant

The contiguous set of linear ½-second data records were further processed to obtain a data set with "slow" exponential response characteristics. This was accomplished by using a weighted logarithmic averaging procedure with a sliding 2-second window (consecutive sets of four ½-second linear data records). The equation used for computing this running average is as follows:

$$SPL_i = 10\log[\ 0.17(10^{0.1L(i-3)}) + 0.21(10^{0.1L(i-2)}) + 0.24(10^{0.1L(i-1)}) + 0.33(10^{0.1L(i)})\ ]$$

where L_i is the value of the i^{th} level

Each exponentially averaged record was assigned a time-of-day and emission coordinates consistent with those of the mid-point between the second and third record of the 4-record set, i.e., the effective mid-point of the 2-second averaging period.

The exponentially averaged and adjusted data set (consecutive records of twenty-seven ⅓-octave bands, 25 Hz - 10 kHz) resulting from the processing to this point will be referred to herein as the "as-measured" data set.

4.1.5 Noise Metric Computations

The as-measured data set was further processed to yield a family of perceived noise and A-weighted noise metrics including Effective Perceived Noise Level (EPNL) and Sound Exposure Level (SEL). Summary tables of as-measured noise level data are presented for each event by helicopter in Appendix A.

4.1.5.1 EPNL Family - The EPNL family of metrics were computed using twenty-four ⅓-octave bands of data (50 Hz - 10 kHz) and include:

- EPNL - Effective Perceived Noise Level computed over the 10 dB down duration of the PNLT data.
- PNLT,PNL - Perceive Noise Level with and without tone correction, respectively.
- $PNLT_{max}$ - Maximum perceived noise level with tone correction.
- Dur(P) - Duration time between the 10 dB down points on the PNLT time history.
- TC - Tone correction and frequency band number, per FAR Part 36, Section B36.5(a), with the

computation for spectral irregularities starting with data in the 50 Hz ⅓-octave band.

- BNDSHR - Adjustment for the presence of bandsharing of tones, per FAR Part 36, Section B36.5(n).

4.1.5.2 SEL Family - The SEL family of metrics were computed using twenty-seven ⅓-octave bands of data (25 Hz-10 kHz) and include:

- SEL - Sound Exposure Level, computed over the 10 dB down duration.
- AL - A-weighted noise level.
- AL_{max} - Maximum A-weighted noise level measured for each event.
- Dur(A) - Duration time between the 10 dB-down point on the AL time history.
- SEL(s) - Simplified SEL computed according to the following:

$$SEL(s) = AL_{max} + 10.0*\log(Dur(A)/2.0)$$

4.1.5.3 OASPL - Also computed for each record was the unweighted overall sound pressure level (OASPL) using twenty-seven ⅓-octave bands of data (25 Hz - 10 kHz).

4.2 ADJUSTMENTS TO REFERENCE CONDITIONS - SIMPLIFIED PROCEDURE

The as-measured data were adjusted to reference conditions using the "simplified" adjustment procedure, as defined in FAR Part 36. Delta adjustments (Δ1, Δ2, Δ3) were computed and arithmetically added to as-measured values of EPNL and SEL to correct them to reference conditions.

$$EPNL_{cor} = EPNL_{as\ meas} + \Delta1(P) + \Delta2 + \Delta3$$

$$SEL_{cor} = SEL_{as\ meas} + \Delta1(A) + \Delta2 + \Delta3$$

Summary tables of as-measured noise level data corrected to reference conditions are presented for each event by helicopter in Appendix B.

4.2.1 Delta 1: Spherical Spreading and Atmospheric Absorption

After a determination was made of both the test and reference propagation distances at the time of $PNLT_{max}$, the as-measured $PNLT_{max}$ spectrum levels were adjusted for:

- The change in atmospheric sound absorption from the test day to standard reference day (77°F, 70% RH) over the test day propagation path.
- The reference day atmospheric sound absorption associated with the difference in propagation distance between the test day and reference propagation paths.
- The inverse square law effect resulting from the difference in propagation distance between the test day and reference propagation paths.

Utilizing these adjusted spectral levels, the corrected $PNLT_{max}$ value ($PNLT_{cor\ max}$) was computed and with it the $\Delta1(P)$ adjustment was obtained, as follows:

$$\Delta1(P) = PNLT_{cor\ max} - PNLT_{max} \text{ (as measured)}$$

Similarly, after adjusting the level of the AL_{max} spectrum, the corrected AL value ($AL_{cor\ max}$) was computed and with it the $\Delta1(A)$ adjustment was obtained, as follows:

$$\Delta1(A) = AL_{cor\ max} - AL_{max} \text{ (as measured)}$$

4.2.2 Delta 2: Distance/Ground Speed Duration Correction

The minimum distance, i.e., the closest point of approach, from both the test (CPA) and reference (CPAR) flight tracks to the microphone diaphragm, were computed and used along with the test (V_{gt}) and reference (V_{gr}) ground speeds in the computation of the distance and speed portions of the duration correction ($\Delta2$). The duration correction was computed as follows:

$$\Delta2 = -10\log(CPA/CPAR) + 10\log(V_{gt}/V_{gr})$$

4.2.3 Delta 3: Source Noise Correction

The source noise correction ($\Delta 3$) accounts for changes in sound level associated with deviations in the in-flight advancing blade tip mach number (Mach Number_{ABT}). Changes in Mach Number_{ABT} can be associated with changes in any single or combination of the following parameters: (1) Rotor RPM; (2) Airspeed; and, (3) Ambient temperature; these are all dominant components of the Mach Number_{ABT}. Note: The source noise correction ($\Delta 3$) is applied only in the case of level flyover.

To quantify the source noise correction, the Mach Number_{ABT} was computed at 77°F and at the helicopters' reference air speed and reference rotor RPM. The in-flight Mach Number_{ABT} was computed by arithmetically summing the helicopter's rotational mach number and its translational mach number.

The as-measured PNLT_{max} versus in-flight Mach Number_{ABT} was then plotted for the microphones positioned directly under, to the left side, and to the right side of the helicopter. First, second, and third order least-squares regression curves were fitted to these data, which included the six clustered data points at the target certification airspeed ($0.9V_h$) and two data points at each of the three additional airspeeds. A second order curve was found to best fit the majority of the data and was used for all further $\Delta 3$ computations. The slope of a line tangent to the regression curve at the Mach Number_{ABT} associated with each data point was used to compute the source noise correction ($\Delta 3$), as follows:

$$\Delta 3 = \text{slope} * (\text{reference Mach Number}_{ABT} - \text{test Mach Number}_{ABT})$$

Appendix E contains a plot of the regression line for each helicopter and the associated 90 percent confidence intervals. Also shown is the equation of the line, correlation coefficient and standard error from the regression analysis.

The Mach Number_{ABT} values for specific noise events were computed using true airspeed and outside air temperature. Note: Since Rotorway, Inc., did not provide data relating indicated air-

speed to the calibrated airspeed, indicated airspeed was used in place of calibrated airspeed for Mach $Number_{ABT}$ computations for the Rotorway Helicopter, as appropriate.

4.3 DIRECT READ - ON-LINE DATA

As pointed out in Section 3.3, the LD 820s were programmed to measure and store the slow scale A-weighted time history data (2-records per second) for each event (SEL_1). The start of data collection was determined by the individual system operators on-site based upon the operator's estimate of the 10 to 15 dB down points of the A-weighted time history. To obtain a measure of the error in the operator estimated 10 to 15 dB down point, the time history data stored in the LD820s were reprocessed at the Acoustics Facility and an SEL was computed over the exact 10 dB-down duration (SEL_2).

The above SEL_1 and SEL_2 values (after adjusting for measurement system drift using stored calibration data) were compared against the SEL values computed using the A-weighted time history data (generated from the as-measured ⅓-octave band digitally recorded data, see Section 4.1). A comparison of the SEL data (SEL, SEL_1, and SEL_2) is presented for each helicopter in Appendix D.

4.4 METEOROLOGICAL DATA

As seen in Section 2.2, meteorological data from three separate sources were collected and recorded during the flight tests. Wherever possible, temperature and relative humidity from the on-site weather station were used to calculate sound level adjustments to reference conditions. When this data was unavailable, the 10 m temperature from the CERL weather station and the relative humidity from the Willard Airport ATIS were used. A summary of data sources and a plot of temperature and relative humidity for each test day can be found in Appendix F.

4.5 TRACKING DATA

Helicopter tracking data, including altitude and lateral deviation from the synchronized still cameras, and ground speed measured by personnel at the CERL weather tower, were reduced by FAA personnel. Test day climb and descent angles were set equal to the reference climb and descent angles. A summary of these results is presented in Appendix G.

5. DISCUSSION OF RESULTS

The as-measured and corrected noise level data are presented without further discussion in Appendices A (Tables A-A-1-1 through A-L-3-2) and B (Tables B-A-1-1 through B-L-3-2), respectively. Appendix C presents as-measured ⅓-octave spectral data for representative measurement runs (Figures C-A-1-1 through C-L-3-3). Appendix D (Figures D-A-1 through D-L-2) presents a comparison of the sound exposure levels computed from: (1) the digitally recorded data; (2) the on-line data based on the field-estimated 10 to 15 dB down duration; and, (3) the on-line data based on the exact 10 dB down duration. Appendix E (Figures E-1 through E-12) presents plots and a statistical summary of the least-squares regression line fit through the Mach Number_{ABT} vs. PNLT_{max} data for level flyover source noise correction. Tables E-1 through E-3 present the regression model equations for the reference data set and the four alternate data sets. The discussions of this section are based on the data presented in Appendices C, D and E.

5.1 SOUND EXPOSURE LEVEL DATA

The primary objective of this study was to obtain the data necessary to evaluate a proposed screening test for noise-certification of light helicopters. In order to examine differences between the proposed screening test and the existing certification methodology, a comparison of the SEL data acquired from this study was performed.

In Appendix D (Tables D-A-1 through D-L-2), a comparison is made of the as-measured SEL computed using: (1) the digitally recorded data (SEL); (2) the on-line data based on the field-estimated 10 to 15 dB down duration (SEL_1); and, (3) the on-line data based on the exact 10 dB down duration (SEL_2).

The SEL_1 and SEL_2 values are in agreement with the tape-derived SEL. The SEL_1 averaged 0.40 dBA higher than the SEL with a standard deviation of 0.20 dBA. The SEL_2 averaged 0.02 dBA higher than the SEL with a standard deviation of 0.20 dBA. The

excellent correlations between the SEL and the SEL_2 are to be expected since they were both computed for the exact 10 dB down duration. The SEL_1, however, was computed over the operator-estimated 10 to 15 dB down duration; as a result, more energy (longer measurement duration) was added to the overall level as compared to the tape-derived SEL. The additional energy resulted in a slightly higher SEL.

5.2 SUPPLEMENTARY ANALYSIS

A supplementary analysis was performed to determine the effect of various design changes on the acoustic signatures of helicopters, using the data obtained from the two Schweizer helicopters. In order to isolate the effects of specific design changes, the following configurations were compared (see Section 1.4 for additional clarification):

Configuration Comparison	Effect Examined
B vs. A	Muffler vs. No muffler
C vs. B	4-blade tail rotor vs. 2-blade tail rotor
D vs. C	Upward directed exhaust vs. Lateral exhaust (4-blade tail rotor)
G vs. B	Upward directed exhaust vs. Lateral exhaust (2-blade tail rotor)
E vs. B	Reduced diameter tail rotor vs. Standard tail rotor (2-blade tail rotor)
F vs. B	Muffler with resonator vs. Muffler
I vs. H	4-blade tail rotor vs. 2-blade tail rotor

5.2.1 Noise Level Analysis

An analysis was performed to examine the effects of each configuration change on the resulting EPNL and SEL. The following summarizes the changes. Actual changes in noise levels are presented in Table 5-1.

TABLE 5-1. EFFECT OF CONFIGURATION CHANGES ON OVERALL NOISE LEVELS

		CONFIGURATIONS						
		B vs A	C vs B	D vs C	E vs B	F vs [illegible]	[illegible] vs B	I vs H
APPROACH	EPNL	-3.44	2.67	-0.36	1.12	2.[illegible]	[illegible].03	-0.05
	SEL	-3.97	4.70	-0.32	2.87	4.[illegible]	[illegible].83	0.58
TAKEOFF	EPNL	-7.57	-0.07	-2.80	0.47	-1.[illegible]	[illegible].75	-4.11
	SEL	-8.04	0.38	-2.04	0.71	-1.[illegible]	[illegible].15	-3.08
LEVEL	EPNL	-6.63	-0.10	-3.27	0.84	-1.[illegible]	[illegible].47	-6.18
FLYOVER	SEL	-6.59	0.18	-2.66	1.26	-1.0[illegible]	[illegible].88	-5.23

Muffler (B vs. A)

- The installation of the muffler resulted in a fairly substantial noise level reduction for all three test cases; 3 to 4 dB for approach, and 6 to 8 dB for takeoff and level flyover.

4-blade tail rotor (C vs. B and I vs. H)

- The 4-blade tail rotor on the piston engine helicopter resulted in increased levels for approach and essentially no change in levels for takeoff and level flyover. However, on the turbine engine helicopter, it resulted in essentially no change in levels for approach and a substantial reduction in noise levels for takeoff and level flyover (3.1 tc 6.2 dB).

Reduced diameter tail rotor (E vs. B)

- The reduced diameter tail rotor resulted in an increase in the noise levels for all flight conditions.

Upward directed exhaust (D vs. C and G vs. B)

- The upward directed exhaust combined with the 4-blade tail rotor resulted in a reduction in the noise levels for takeoff and level flyover. However, when combined with the 2-blade tail rotor, it resulted in and increase in the noise levels for approach and essentially no change in levels for takeoff and level flyover.

Resonator (F vs. B)

- The addition of the resonator resulted in a reduction in the noise levels for takeoff and level flyover and an increase in levels for approach.

5.2.2 Spectral Analysis

To better characterize the effects of the various design configurations tested, spectral time history plots and level versus frequency plots (at $PNLT_{max}$) were generated for a representative event in each flight series (see Appendix C). Each as-measured spectral time history was plotted over the period of the 10 dB down duration. Examination and comparison of the plots (Figures C-A-1-1 through C-I-3-3) provide some insight into the frequency components affected by each configuration change. Table 5-2 is a summary of the changes observed in the 1/3-octave frequency bands.

TABLE 5-2. EFFECT OF CONFIGURATION CHANGES ON 1/3-OCTAVE BAND LEVELS

CHANGE	FLIGHT SERIES	REDUCED BANDS *	INCREASED BANDS*
Muffler Addition	Approach	21-23,26-30	
	Takeoff	26-38	14-15
	Level Flyover	25-38	
4-Blade Tail Rotor	Approach		21-25
	Takeoff	15-18	
	Level Flyover	15-16,18-19	
Reduced Diameter Tail Rotor	Approach	15-16	21-23,26-30
	Takeoff	15-17	18
	Level Flyover	15-16	
Upward Directed Exhaust	Approach	15-16	
	Takeoff	15-16,18-19	
	Level Flyover	15-16,18-19	
Resonator	Approach	15-16	
	Takeoff	15-16,18	
	Level Flyover	15-16,18	

* ANSI S1.11-1986 Band Numbers.

The addition of the muffler resulted in a decrease in level in most 1/3-octave frequency bands above 315 Hz (band 26). The remaining configuration changes (all of which included the muffler in their design) affected the frequency bands below 100 Hz (band 20). Changing the tail rotor design from a 2-blade rotor to a 4-blade rotor with reduced rpm resulted in a clear spectral shift. This shift is a result of the change in the blade-passage frequency (BPF) associated with each rotor design. The fundamental BPF is given by BPF = (# of blades)*(rotor rpm)/60. For the 2-blade rotor f = 103 Hz (band 20) and for the 4-blade rotor f = 154 Hz (band 22). The BPF is clearly visible in the spectral time histories of the 2-blade design but is less prominent in the 4-blade design (Figures C-H-1-2 and C-I-1-2).

5.3 DELTA 3: SOURCE NOISE CORRECTION

As stated in Section 4.2.3., the source noise correction was computed for level flyover data using the slope of a second order least-squares regression curve fitted to the as measured $PNLT_{max}$ vs. advancing blade tip mach number (Mach $Number_{ABT}$) data (computed from the helicopter's rotational and translational mach numbers). Figures E-1 through E-12, Appendix E, present plots of these data, regression models and the 90 percent confidence interval band (as indicated by the dashed lines) for data measured at the centerline, right side and left side of the helicopter. Also included are the regression model equations, correlation coefficients (r), and standard errors of estimate.

The second order regression models chosen for the source noise correction generally show a high correlation between $PNLT_{max}$ and Mach $Number_{ABT}$ at the centerline measurement position, with slightly reduced correlation at the right and left side positions. Low correlation is especially evidenced for the right and left side data in Figures E-1, E-2, and E-12. In these cases, high winds caused the noise levels at the sideline east microphone to be higher than at the sideline west microphone (See Appendix G for a summary of the meteorological conditions.)

5.4 EFFECT OF CLUSTERED DATA POINTS ON DELTA 3 REGRESSION MODELS

The data used to determine the regression models in Appendix E are comprised of 14 measured points at 5 target airspeeds: two at $1.0V_h$, six at $0.9V_h$, two at $0.8V_h$, two at $0.7V_h$, and two at $0.6V_h$. Note that at $0.9V_h$ there are six data points (three in each direction, as required at the certification airspeed). To determine if a least-squares regression model fitted to these data is influenced by the larger number of data points at $0.9V_h$ (six vs. two), an analysis was performed using four alternate data sets constructed from the original. Alternate Data Set 1 includes the original 8 points at 0.6, 0.7, 0.8, and $1.0V_h$, and two new points derived from the average of the data points from the three N-S flights and the average of the data points from the three S-N flights at $0.9V_h$. Alternate Data Sets Two, Three, and Four include the original 8 points at 0.6, 0.7, 0.8, and $1.0V_h$, and two new data points each using the first two, second two and third two consecutive test flights respectively (consecutive N-S and S-N flights) at $0.9V_h$.

A summary of the second order least-squares regression equations used to model the original data set and each of the four alternate data sets is shown in Tables E-1 through E-34. These equations were used to compute an average $\Delta 3$ (averaged over the five target airspeeds) for the original data set and for each of the four alternate sets ($\Delta 3$, $\Delta 3_1$, $\Delta 3_2$, $\Delta 3_3$, $\Delta 3_4$ respectively). Tables 5-3A through 5-3D present the average differences between $\Delta 3$ values obtained from the original and each alternate data set (difference = $\Delta 3-\Delta 3_i$).

As can be seen in Tables 5-3A (centerline), 5-3B (left side), and 5-3C (right side) the average differences are equal to or less than 0.14 dB, 0.07 dB, and 0.11 dB, respectively, with the majority of the differences (70 percent) less than 0.05 dB. In addition, the standard deviations were less than 0.34 dB. The arithmetic average and standard deviations for the pooled centerline, left side, and right side data are presented in Table 5-3D. The average difference is equal to or less than 0.07 dB and the standard

TABLE 5-3A. DELTA 3 COMPARISON

CENTERLINE CENTER

Helicopter		Difference $\Delta3-\Delta3_1$ (dB)	Difference $\Delta3-\Delta3_2$ (dB)	Difference $\Delta3-\Delta3_3$ (dB)	Difference $\Delta3-\Delta3_4$ (dB)
Schweizer 300	Average	0.00	0.00	0.00	0.00
Configuration A	Std Dev	0.02	0.01	0.03	0.00
Schweizer 300	Average	0.09	-0.05	-0.10	-0.07
Configuration B	Std Dev	0.01	0.01	0.14	0.03
Schweizer 300	Average	0.01	-0.01	0.01	0.02
Configuration C	Std Dev	0.00	0.01	0.00	0.02
Schweizer 300	Average	-0.06	-0.06	-0.03	-0.06
Configuration D	Std Dev	0.08	0.04	0.08	0.07
Schweizer 300	Average	0.00	0.00	0.01	-0.02
Configuration E	Std Dev	0.01	0.00	0.02	0.04
Schweizer 300	Average	0.01	0.01	0.14	-0.01
Configuration F	Std Dev	0.02	0.02	0.10	0.04
Schweizer 300	Average	-0.03	-0.01	-0.01	-0.06
Configuration G	Std Dev	0.03	0.02	0.02	0.07
Schweizer 330	Average	-0.01	-0.00	0.00	-0.02
Configuration H	Std Dev	0.10	0.12	0.10	0.08
Schweizer 330	Average	0.00	0.01	0.01	0.00
Configuration I	Std Dev	0.02	0.03	0.03	0.01
Enstrom	Average	-0.01	-0.03	0.05	-0.04
280FX	Std Dev	0.07	0.08	0.11	0.01
Enstrom	Average	-0.03	-0.02	-0.03	-0.01
TH28	Std Dev	0.03	0.03	0.03	0.01
Rotorway	Average	-0.01	0.00	0.03	-0.02
Exec 90	Std Dev	0.02	0.00	0.02	0.02

TABLE 5-3B. DELTA 3 COMPARISON
LEFT SIDE

Helicopter		Difference $\Delta3-\Delta3_1$ (dB)	Difference $\Delta3-\Delta3_2$ (dB)	Difference $\Delta3-\Delta3_3$ (dB)	Difference $\Delta3-\Delta3_4$ (dB)
Schweizer 300 Configuration A	Average	-0.04	-0.05	0.00	-0.05
	Std Dev	0.04	0.06	0.01	0.07
Schweizer 300 Configuration B	Average	0.04	0.02	0.00	0.05
	Std Dev	0.27	0.26	0.18	0.32
Schweizer 300 Configuration C	Average	0.01	0.01	0.01	0.01
	Std Dev	0.01	0.01	0.01	0.01
Schweizer 300 Configuration D	Average	-0.06	-0.02	-0.05	-0.07
	Std Dev	0.11	0.04	0.14	0.10
Schweizer 300 Configuration E	Average	-0.01	0.00	-0.02	-0.01
	Std Dev	0.01	0.00	0.03	0.01
Schweizer 300 Configuration F	Average	0.01	-0.01	0.01	-0.02
	Std Dev	0.01	0.03	0.02	0.06
Schweizer 300 Configuration G	Average	0.03	0.03	0.01	0.03
	Std Dev	0.06	0.08	0.04	0.06
Schweizer 330 Configuration H	Average	-0.06	0.03	-0.00	0.01
	Std Dev	0.11	0.06	0.21	0.05
Schweizer 330 Configuration I	Average	0.01	0.01	0.00	0.01
	Std Dev	0.01	0.02	0.02	0.03
Enstrom 280FX	Average	0.04	0.03	0.02	-0.02
	Std Dev	0.03	0.11	0.09	0.04
Enstrom TH28	Average	-0.03	-0.02	-0.02	-0.02
	Std Dev	0.03	0.03	0.02	0.02
Rotorway Exec 90	Average	0.00	0.00	-0.03	0.00
	Std Dev	0.00	0.00	0.02	0.01

TABLE 5-3C. DELTA 3 COMPARISON RIGHT SIDE

Helicopter		Difference $\Delta3-\Delta3_1$ (dB)	Difference $\Delta3-\Delta3_2$ (dB)	Difference $\Delta3-\Delta3_3$ (dB)	Difference $\Delta3-\Delta3_4$ (dB)
Schweizer 300 Configuration A	Average	0.00	0.00	0.00	0.01
	Std Dev	0.02	0.01	0.03	0.06
Schweizer 300 Configuration B	Average	-0.07	-0.02	-0.06	-0.10
	Std Dev	0.18	0.19	0.01	0.33
Schweizer 300 Configuration C	Average	0.00	0.00	0.00	0.01
	Std Dev	0.01	0.00	0.00	0.02
Schweizer 300 Configuration D	Average	-0.08	-0.11	-0.01	-0.08
	Std Dev	0.08	0.07	0.03	0.07
Schweizer 300 Configuration E	Average	-0.02	-0.05	0.00	-0.01
	Std Dev	0.01	0.05	0.02	0.01
Schweizer 300 Configuration F	Average	-0.01	-0.02	-0.02	0.00
	Std Dev	0.06	0.06	0.08	0.02
Schweizer 300 Configuration G	Average	-0.02	0.04	-0.05	-0.03
	Std Dev	0.05	0.11	0.02	0.03
Schweizer 330 Configuration H	Average	0.01	0.01	0.00	0.02
	Std Dev	0.02	0.03	0.03	0.05
Schweizer 330 Configuration I	Average	0.00	-0.01	0.00	-0.01
	Std Dev	0.01	0.01	0.02	0.01
Enstrom 280FX	Average	0.01	-0.01	0.02	0.02
	Std Dev	0.06	0.02	0.08	0.07
Enstrom TH28	Average	-0.04	-0.04	-0.03	-0.02
	Std Dev	0.05	0.06	0.05	0.02
Rotorway Exec 90	Average	0.00	0.00	-0.05	0.01
	Std Dev	0.01	0.00	0.10	0.01

TABLE 5-3D. DELTA 3 COMPARISON

AVERAGE OF CENTERLINE, LEFT SIDE, AND RIGHT SIDE

[illegible]	Difference $\Delta 3-\Delta 3_1$ (dB)	Difference $\Delta 3-\Delta 3_2$ (dB)	Difference $\Delta 3-\Delta 3_3$ (dB)	Difference $\Delta 3-\Delta 3_4$ (dB)
[illegible]	-0.01	-0.02	0.00	-0.01
[illegible] Dev	0.05	0.06	0.04	0.09
Schw[illegible] Average	0.02	-0.02	-0.05	-0.04
Configuration [illegible] Std Dev	0.33	0.32	0.23	0.46
Schweizer [illegible] Average	0.01	0.00	0.01	0.03
Configurati[illegible] Std Dev	0.01	0.01	0.01	0.03
Schweizer [illegible] Average	-0.07	-0.06	-0.03	-0.07
Configurat[illegible] Std Dev	0.16	0.09	0.16	0.14
Schw[illegible] Average	-0.01	-0.02	0.00	-0.01
Configur[illegible] Std Dev	0.02	0.05	0.04	0.04
Schw[illegible] Average	0.00	-0.01	0.04	-0.01
Confi[illegible] Std Dev	0.06	0.07	0.13	0.08
Schw[illegible] Average	-0.01	0.02	-0.02	-0.02
Configuration [illegible] Std Dev	0.08	0.14	0.05	0.10
Schw[illegible] Average	-0.02	0.01	0.00	0.00
Con[illegible] Std Dev	0.11	0.14	0.23	0.11
Schw[illegible] Average	0.00	0.00	0.00	0.00
Configuration [illegible] Std Dev	0.02	0.04	0.04	0.03
[illegible] Average	0.01	0.00	0.03	-0.01
[illegible]	0.10	0.14	0.16	0.08
[illegible]	-0.03	-0.03	-0.03	-0.02
[illegible]	0.07	0.07	0.06	0.03
[illegible]	0.00	0.00	-0.02	0.00
[illegible]	[illegible]	0.00	0.10	0.02

deviations are less than or equal to 0.46 dB. This suggests that the larger number of points at the target certification airspeed (six vs. two) has little if any influence on the resulting $PNLT_{max}$ vs. Mach $Number_{ABT}$ curve fit.

A further comparison was made of the $PNLT_{MAX}$ values computed at 77°F and at the target certification airspeed ($0.9V_H$) using the above five regression models. The computed values were compared one to the other using the model of the original data set as the reference. The resultant differences are shown in Tables 5-4A through 5-4D.

As can be seen in Tables 5-4A (centerline), 5-4B (left side), and 5-4C (right side) the average differences are equal to or less than 0.40 dB, 0.41 dB, and 0.62 dB, respectively, with the majority of the differences (75 percent) equal to or less than 0.20 dB. The arithmetic average for the pooled centerline, left side, and right side data are presented in Table 5-4D. The average difference is less than or equal to 0.36 dB. This suggests that the larger number of points at the target certification airspeed (six vs. two) has little if any influence on the resulting $PNLT_{max}$ vs. Mach $Number_{ABT}$ curve fit.

TABLE 5-4A. CALCULATED PNLTm DIFFERENCE AT CERTIFICATION AIRSPEED CENTERLINE CENTER

Helicopter	Reference	Reference - Alt. Set 1	Reference - Alt. Set 2	Reference - Alt. Set 3	Reference - Alt. Set 4
Schweizer 300 Configuration A	91.80	-0.08	0.03	-0.12	-0.03
Schweizer 300 Configuration B	88.32	-0.20	-0.18	-0.30	-0.18
Schweizer 300 Configuration C	84.43	0.00	0.09	-0.06	-0.14
Schweizer 300 Configuration D	81.87	-0.12	-0.30	0.14	-0.15
Schweizer 300 Configuration E	85.02	0.05	0.07	-0.06	0.10
Schweizer 300 Configuration F	82.43	-0.02	0.01	-0.12	0.03
Schweizer 300 Configuration G	84.73	0.15	0.17	0.12	0.36
Schweizer 330 Configuration H	88.79	-0.08	-0.04	-0.04	-0.16
Schweizer 330 Configuration I	82.96	-0.12	-0.17	-0.11	-0.11
Enstrom 280FX	84.54	-0.15	-0.03	-0.36	0.11
Enstrom TH28	88.34	-0.28	-0.28	-0.21	-0.11
Rotorway EXEC90	83.07	-0.21	-0.02	-0.40	-0.36

TABLE 5-4B. CALCULATED PNLTm DIFFERENCE AT CERTIFICATION AIRSPEED LEFT SIDE

Helicopter	Reference	Reference - Alt. Set 1	Reference - Alt. Set 2	Reference - Alt. Set 3	Reference - Alt. Set 4
Schweizer 300 Configuration A	87.50	-0.14	-0.11	-0.02	-0.12
Schweizer 300 Configuration B	82.06	0.06	0.10	0.04	0.09
Schweizer 300 Configuration C	81.10	-0.03	0.02	-0.05	-0.11
Schweizer 300 Configuration D	78.83	-0.05	-0.06	0.24	-0.12
Schweizer 300 Configuration E	81.83	0.11	0.03	0.10	0.05
Schweizer 300 Configuration F	80.65	0.12	0.11	0.08	0.08
Schweizer 300 Configuration G	82.12	-0.19	-0.26	-0.07	-0.21
Schweizer 330 Configuration H	85.22	-0.02	0.07	-0.13	0.03
Schweizer 330 Configuration I	80.69	0.15	0.28	0.00	0.26
Enstrom 280FX	83.92	-0.11	-0.18	-0.23	0.11
Enstrom TH28	85.62	-0.18	-0.41	-0.12	-0.04
Rotorway EXEC90	79.91	0.07	0.01	-0.27	0.00

TABLE 5-4C. CALCULATED PNLTm DIFFERENCE AT CERTIFICATION AIRSPEED RIGHT SIDE

Helicopter	Reference	Reference - Alt. Set 1	Reference - Alt. Set 2	Reference - Alt. Set 3	Reference - Alt. Set 4
Schweizer 300 Configuration A	88.26	0.02	0.01	-0.19	0.16
Schweizer 300 Configuration B	84.48	-0.22	-0.18	-0.12	-0.33
Schweizer 300 Configuration C	81.23	-0.12	0.09	0.07	-0.18
Schweizer 300 Configuration D	78.96	-0.35	-0.62	0.05	-0.42
Schweizer 300 Configuration E	81.75	0.14	0.31	0.04	0.02
Schweizer 300 Configuration F	79.54	-0.04	0.01	0.08	-0.11
Schweizer 300 Configuration G	81.02	0.07	-0.17	0.28	0.11
Schweizer 330 Configuration H	87.68	0.05	0.14	0.07	0.03
Schweizer 330 Configuration I	81.82	-0.08	-0.09	-0.07	-0.10
Enstrom 280FX	81.00	0.08	0.02	0.10	0.09
Enstrom TH28	86.39	-0.12	0.04	-0.03	-0.27
Rotorway EXEC28	79.35	-0.05	0.06	-0.42	0.14

TABLE 5-4D. CALCULATED PNLTm DIFFERENCE AT CERTIFICATION AIRSPEED
AVERAGE OF CENTERLINE, LEFT SIDE, AND RIGHT SIDE

Helicopter	Reference - Alt. Set 1	Reference - Alt. Set 2	Reference - Alt. Set 3	Reference - Alt. Set 4
Schweizer 300 Configuration A	-0.06	-0.02	-0.11	0.00
Schweizer 300 Configuration B	-0.12	-0.09	-0.13	-0.14
Schweizer 300 Configuration C	-0.05	0.07	-0.01	-0.14
Schweizer 300 Configuration D	-0.18	-0.33	0.14	-0.23
Schweizer 300 Configuration E	0.10	0.14	0.03	0.06
Schweizer 300 Configuration F	-0.02	0.04	0.01	0.00
Schweizer 300 Configuration G	0.01	-0.09	0.11	0.09
Schweizer 330 Configuration H	-0.02	0.06	-0.03	-0.03
Schweizer 330 Configuration I	-0.02	0.00	-0.14	0.02
Enstrom 280FX	-0.06	-0.06	-0.13	0.10
Enstrom TH28	-0.19	-0.22	-0.12	-0.14
Rotorway EXEC28	-0.06	0.02	-0.36	-0.07

6. CONCLUSIONS

This measurement study has resulted in an extensive acoustic data base for five light helicopters, and several design configurations thereof.

Additional conclusions based on the findings of this study can be summarized as follows:

- The on-line operator-estimated SEL averaged 0.4 dBA higher than the tape-derived SEL with an average standard deviation of 0.2 dBA.

- The on-line reprocessed (exact 10 dB down points) SEL averaged 0.02 dBA higher than the tape-derived SEL with a standard deviation of 0.2 dBA.

- The larger number of data points at the target certification airspeed has little if any influence upon the $PNLT_{max}$ vs. Mach $Number_{ART}$ curve and resulting Δ3 source noise correction for light helicopters.

- The noise reduction (both overall level and level in individual frequency bands) resulting from the addition of the muffler was fairly substantial, 3 to 4 dB for approach, and 6 to 8 dB for takeoff and sideline.

- The addition of the resonator resulted in a reduction in the noise levels for takeoff and level flyover and an increase in noise level for approach.

7. RECOMMENDATIONS

The comparison of the sound exposure level data presented in Appendix D shows that an operator-estimated SEL can be obtained in the field using a relatively inexpensive integrating sound level meter (SLM); and although the operator-estimated SEL tends to be slightly higher than the tape-derived SEL (on average 0.4 dBA), the difference rarely exceeds 1 dBA. Based on this comparison, it appears that light-helicopter noise certification can be performed with a relatively high degree of accuracy using a hand-held SLM.

The primary objective of this measurement study was to obtain the data necessary to evaluate a screening test for light helicopters proposed jointly by the Federal Aviation Administration and the International Civil Aviation Organization. At the December, 1991, ICAO meeting held in Montreal, Canada, the FAA used the results of this measurement study as the foundation for the official U.S. position on the subject of the proposed screening test. The position tendered by the FAA was that the proposed is a viable alternative to the current light-helicopter noise certification procedure found in both FAR Part 36 and ICAO, Annex 16[3] and that these documents should be modified accordingly.

[3] "International Standards and Recommended Practices, Environmental Protection," ANNEX 16 to the Convention on International Civil Aviation, Volume I, Aircraft Noise, Second Edition, 1988.

APPENDIX A

AS-MEASURED NOISE LEVEL DATA

This Appendix presents the as-measured noise level data, including EPNL, SEL, AL_{MAX}, and $PNLT_{MAX}$, by site, date, and helicopter configuration, Tables A-A-1-1* through A-L-3-2.

*In the numerical notation for Table number, the first letter denotes Appendix, the second letter denotes helicopter configuration (as discussed in Section 1.4), the first number denotes site, i.e., site 1 - centerline, site 2 - sideline/east, or site 3 - sideline/west, and the second number differentiates between standard Far Part 36 tests (denoted by a 1) and additional flyover tests (denoted by a 2). For example, Table A-A-1-1 contains noise data measured for helicopter Configuration A (Schweizer, Standard Configuration) at the centerline measurement site, subject to standard FAR Part 36 requirements.

U.S. Department of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-A-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B1	94.70	91.71	92.60	93.15	94.81	81.72	87.71	24.50	25.50	.02	1.66	20	25	26	24
B2	94.26	90.41	90.84	91.91	93.55	79.08	86.30	30.00	30.00	.02	1.64	20	25	34	26
B3	93.14	89.62	90.11	91.40	92.92	78.89	86.48	26.50	26.00	.03	1.49	20	25	26	27
B4	92.49	88.77	89.82	91.86	93.34	79.82	87.44	20.00	20.00	.03	1.54	20	26	25	22
B5	93.27	90.04	90.86	92.87	94.44	80.86	87.70	20.00	20.50	.03	1.57	20	25	26	23
B6	94.49	91.24	91.92	92.49	94.17	80.86	87.80	25.50	25.50	.03	1.68	20	25	26	24
Avg.	93.72	90.30	91.02	92.28	93.87	80.20	87.24	24.42	24.58	.03	1.60				
Std Dv	.88	1.07	1.06	.67	.72	1.12	.67	3.89	3.76	.01	.08				
90% CI	.73	.88	.87	.55	.59	.92	.55	3.20	3.09	.00	.06				
TAKEOFF -- TARGET IAS 40.8 kts															
C1	95.86	91.80	92.80	91.88	94.37	79.48	84.89	43.00	32.50	.00	2.50	20	26	25	35
C5	96.04	92.05	92.16	92.27	94.56	79.73	84.61	35.00	33.50	.00	2.29	20	26	35	34
C6	97.01	92.99	94.09	93.31	95.76	80.97	85.33	41.00	40.00	.01	2.45	20	26	35	34
C7	95.72	91.75	92.43	91.54	93.71	79.16	83.42	42.50	41.00	.02	2.26	20	25	35	34
C8	95.68	91.73	92.56	92.11	94.28	79.60	84.55	39.50	31.50	.02	2.17	20	25	35	34
C9	96.48	92.53	93.16	92.72	95.24	80.49	85.03	37.00	33.50	.00	2.51	20	26	35	34
Avg.	96.13	92.14	92.87	92.30	94.65	79.91	84.64	39.67	35.33	.01	2.36				
Std Dv	.52	.51	.69	.63	.73	.68	.66	3.16	4.08	.01	.14				
90% CI	.43	.42	.57	.52	.60	.56	.54	2.60	3.36	.01	.12				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	90.93	86.75	87.89	89.17	91.53	76.59	83.22	27.00	25.00	.00	2.37	20	25	26	35
A2	89.46	85.50	86.18	88.55	90.73	76.07	82.87	20.50	18.00	.00	2.18	20	25	34	35
A3	90.94	86.86	87.88	88.93	91.34	76.50	82.70	27.50	22.50	.00	2.41	20	25	26	35
A4	89.83	85.64	86.01	89.50	91.78	77.26	83.15	15.00	14.50	.00	2.34	20	25	26	35
A5	90.57	86.28	86.70	89.37	91.85	77.04	82.91	18.50	17.00	.00	2.50	20	26	25	35
A6	89.57	85.49	85.57	88.18	90.32	75.79	82.55	19.00	17.00	.00	2.14	20	26	25	34
Avg.	90.22	86.09	86.71	88.95	91.26	76.54	82.90	21.25	19.00	.00	2.32				
Std Dv	.68	.63	.99	.51	.61	.56	.26	4.99	3.94	.00	.14				
90% CI	.56	.52	.81	.42	.50	.46	.21	4.10	3.24	.00	.11				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-A-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D1	91.04	87.09	87.59	90.28	92.53	77.81	83.07	19.00	18.00	.00	2.25	20	26	35	25
D2	90.13	86.09	86.45	89.48	91.62	77.16	82.97	17.00	16.50	.00	2.26	20	26	34	35
Avg.	90.58	86.59	87.02	89.88	92.07	77.49	83.02	18.00	17.25	.00	2.26				
Std Dv	.64	.71	.80	.57	.64	.46	.07	1.41	1.06	.00	.01				
90% CI	2.87	3.16	3.58	2.53	2.87	2.05	.32	6.31	4.74	.00	.03				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D5	90.06	86.05	86.82	88.57	90.83	75.76	81.97	25.50	19.50	.00	2.26	20	25	35	34
D6	89.52	85.74	87.87	88.85	91.15	76.49	82.97	27.50	15.00	.02	2.33	20	25	35	34
Avg.	89.79	85.90	87.34	88.71	90.99	76.13	82.47	26.50	17.25	.01	2.30				
Std Dv	.38	.22	.75	.20	.23	.52	.71	1.41	3.18	.01	.05				
90% CI	1.70	.98	3.34	.88	1.01	2.30	3.16	6.31	14.21	.06	.22				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D7	90.16	86.06	86.04	87.83	90.10	75.25	82.32	24.00	22.50	.02	2.27	20	25	26	35
D8	89.67	85.53	85.62	87.81	90.13	75.21	82.80	22.00	20.00	.02	2.31	20	25	34	35
Avg.	89.92	85.79	85.83	87.82	90.11	75.23	82.56	23.00	21.25	.02	2.29				
Std Dv	.35	.37	.30	.01	.02	.03	.34	1.41	1.77	.00	.03				
90% CI	1.55	1.67	1.32	.06	.09	.13	1.52	6.31	7.89	.00	.13				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D9	91.02	86.91	87.91	88.99	91.22	76.22	83.09	29.50	24.00	.02	2.23	20	25	34	35
D10	90.57	86.58	88.83	87.20	89.34	74.81	82.74	50.50	47.00	.00	2.28	20	26	25	20
Avg.	90.79	86.75	88.37	88.10	90.28	75.51	82.91	40.00	35.50	.01	2.26				
Std Dv	.32	.23	.65	1.27	1.33	1.00	.25	14.85	16.26	.01	.04				
90% CI	1.42	1.04	2.92	5.65	5.94	4.45	1.10	66.30	72.61	.06	.16				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-A-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B1	89.32	86.81	87.92	87.49	88.39	76.86	81.07	25.50	33.00	.00	.90	26	26	27	28
B2	87.56	84.85	86.25	83.18	84.48	71.98	78.90	53.50	49.50	.00	1.53	20	25	27	23
B3	87.64	84.74	85.95	83.70	85.20	72.38	78.80	45.50	45.00	.00	1.50	27	27	25	26
B4	86.79	83.89	85.75	82.89	84.10	72.23	78.82	45.00	43.00	.00	1.58	27	27	25	24
B5	87.10	84.40	86.12	83.86	85.42	72.95	79.12	41.50	37.00	.00	1.72	27	27	25	24
B6	87.84	85.21	85.68	83.00	84.25	71.79	78.56	49.00	48.50	.04	1.94	20	25	27	28
Avg.	87.71	84.98	86.28	84.02	85.31	73.03	79.21	43.33	42.67	.01	1.53				
Std Dv	.88	1.00	.83	1.74	1.60	1.92	.93	9.64	6.51	.02	.35				
90% CI	.72	.82	.68	1.43	1.32	1.58	.76	7.93	5.35	.01	.29				
TAKEOFF -- TARGET IAS 40.8 kts															
C1	91.35	87.93	89.17	85.71	87.32	74.62	80.55	57.00	57.50	.04	1.61	23	26	34	35
C5	92.68	89.21	90.75	87.82	89.94	76.60	81.25	52.00	53.00	.00	2.71	20	25	32	34
C6	91.69	88.33	89.30	86.09	87.71	74.53	80.68	60.00	60.00	.00	1.70	23	25	33	35
C7	91.73	88.25	89.37	85.91	87.81	74.53	79.30	61.00	60.50	.00	1.90	28	34	26	33
C8	91.21	88.01	88.97	85.93	87.70	74.13	79.89	61.00	60.50	.05	1.72	20	35	34	36
C9	91.83	88.57	89.82	86.41	88.07	74.84	80.23	63.00	63.00	.05	1.66	23	34	35	26
Avg.	91.75	88.38	89.56	86.31	88.09	74.88	80.32	59.00	59.08	.02	1.88				
Std Dv	.52	.47	.65	.77	.94	.88	.68	3.95	3.46	.03	.42				
90% CI	.42	.38	.53	.64	.77	.72	.56	3.25	2.84	.02	.34				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	86.94	83.70	84.10	83.53	84.96	72.13	79.56	31.50	32.50	.00	1.43	23	26	34	33
A2	86.93	83.47	84.06	84.27	85.90	72.68	77.35	27.50	27.50	.00	1.89	20	35	34	33
A3	-	83.82	84.05	83.80	85.21	72.44	79.16	29.00	-	.00	1.41	23	26	34	35
A4	87.40	83.78	84.56	85.21	86.89	73.59	77.99	25.00	25.00	.00	1.75	28	26	28	34
A5	87.82	84.36	84.74	84.26	86.07	72.63	79.34	32.50	32.50	.00	1.81	20	26	35	34
A6	-	83.14	84.51	83.81	85.46	72.40	76.84	32.50	-	.00	1.65	20	26	28	35
Avg.	87.27	83.71	84.34	84.15	85.75	72.64	78.37	29.67	29.38	.00	1.66				
Std Dv	.43	.41	.30	.60	.70	.50	1.14	3.04	3.75	.00	.20				
90% CI	.50	.33	.25	.49	.57	.41	.94	2.50	4.41	.00	.16				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-A-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D1	88.26	84.93	85.36	86.19	87.68	74.39	80.20	25.00	25.50	.00	1.79	20	26	34	35
D2	87.60	84.23	85.70	85.40	87.17	73.94	78.60	30.00	30.00	.00	1.90	28	26	28	35
Avg.	87.93	84.58	85.53	85.79	87.43	74.17	79.40	27.50	27.75	.00	1.85				
Std Dv	.47	.49	.24	.56	.36	.32	1.13	3.54	3.18	.00	.08				
90% CI	2.08	2.21	1.08	2.49	1.61	1.42	5.05	15.78	14.21	.00	.35				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D5	86.51	83.21	83.60	83.63	85.03	71.77	79.05	30.50	30.50	.00	1.40	23	26	34	35
D6	86.25	82.66	83.99	83.48	84.99	71.62	77.08	34.50	34.50	.00	1.52	28	26	35	28
Avg.	86.38	82.93	83.80	83.56	85.01	71.69	78.07	32.50	32.50	.00	1.46				
Std Dv	.18	.39	.27	.11	.03	.11	1.39	2.83	2.83	.00	.08				
90% CI	.82	1.74	1.22	.47	.13	.47	6.22	12.63	12.63	.00	.38				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D7	86.97	83.65	83.90	83.28	85.45	71.79	79.17	32.50	32.50	.00	2.23	20	26	34	35
D8	86.60	82.82	83.73	82.79	84.69	70.94	76.95	38.00	38.50	.00	2.07	28	26	35	28
Avg.	86.79	83.24	83.81	83.04	85.07	71.37	78.06	35.25	35.50	.00	2.15				
Std Dv	.26	.59	.12	.35	.54	.60	1.57	3.89	4.24	.00	.11				
90% CI	1.17	2.62	.54	1.55	2.40	2.68	7.01	17.36	18.94	.00	.51				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D9	87.18	83.82	84.12	82.68	84.11	71.22	78.64	39.00	41.00	.00	1.49	23	26	34	33
D10	86.45	82.81	84.00	82.16	83.53	70.02	76.31	50.00	50.00	.00	1.98	28	26	28	35
Avg.	86.82	83.32	84.06	82.42	83.82	70.62	77.47	44.50	45.50	.00	1.74				
Std Dv	.52	.71	.09	.37	.41	.85	1.65	7.78	6.36	.00	.35				
90% CI	2.30	3.19	.38	1.64	1.83	3.79	7.36	34.73	28.41	.00	1.55				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

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TABLE A-A-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B1	88.55	85.39	86.56	84.08	85.52	72.45	79.09	51.50	51.50	.00	1.49	20	23	24	25
B2	89.00	85.74	87.41	84.66	85.79	73.52	79.42	49.00	49.50	.00	1.82	20	25	23	27
B3	87.54	84.83	86.61	83.73	85.84	71.91	78.45	59.00	41.50	.00	2.12	20	25	24	34
B4	87.93	84.97	86.62	83.75	84.86	72.27	79.15	54.50	49.50	.00	1.13	26	26	23	28
B5	88.17	85.01	85.95	84.07	85.88	72.58	79.34	43.50	43.50	.00	1.93	27	27	23	24
B6	88.31	85.22	86.16	83.98	85.30	72.50	78.48	46.50	45.50	.00	2.43	20	25	34	26
Avg.	88.25	85.19	86.55	84.05	85.53	72.54	78.99	50.67	46.83	.00	1.82				
Std Dv	.50	.33	.50	.34	.40	.54	.42	5.59	3.93	.00	.46				
90% CI	.41	.27	.41	.28	.33	.44	.35	4.60	3.24	.00	.38				
TAKEOFF -- TARGET IAS 40.8 kts															
C1	93.25	89.35	91.09	90.00	92.11	77.47	81.71	46.00	45.00	.06	2.05	20	34	35	33
C5	92.31	88.84	89.02	87.53	89.49	75.96	80.31	40.50	40.00	.01	1.96	20	34	25	33
C6	93.26	89.56	89.60	89.49	91.56	76.99	80.70	36.50	34.50	.02	2.06	20	34	35	33
C7	94.07	90.41	90.86	89.25	91.97	78.37	81.63	35.50	35.50	.02	2.76	20	32	34	25
C8	93.31	89.67	88.92	87.34	89.48	75.86	79.88	40.50	41.00	.02	2.46	20	25	34	32
C9	92.96	89.31	89.13	87.37	89.87	75.91	80.18	42.00	41.50	.00	2.51	20	25	34	35
Avg.	93.19	89.52	89.77	88.50	90.75	76.76	80.73	40.17	39.58	.02	2.30				
Std Dv	.57	.52	.96	1.21	1.26	1.03	.77	3.82	3.94	.02	.32				
90% CI	.47	.43	.79	1.00	1.04	.85	.63	3.14	3.24	.02	.26				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	88.79	85.15	87.38	86.21	87.70	74.21	78.02	41.50	41.50	.01	1.48	28	26	35	34
A2	87.69	84.46	85.94	85.86	87.27	73.90	79.82	32.00	32.00	.00	1.41	23	26	35	34
A3	88.73	85.16	86.81	85.12	86.73	73.39	77.46	44.00	45.50	.07	1.55	28	26	35	28
A4	88.12	84.77	86.14	85.37	86.80	73.35	79.64	38.00	37.50	.04	1.39	23	26	34	35
A5	88.03	84.37	84.73	85.03	86.85	73.35	77.56	27.50	30.00	.04	1.82	28	26	35	34
A6	88.51	85.24	87.34	86.03	87.69	73.87	79.65	44.50	43.50	.04	1.66	20	34	26	35
Avg.	88.31	84.86	86.39	85.60	87.17	73.68	78.69	37.92	38.33	.03	1.55				
Std Dv	.43	.38	1.01	.50	.45	.37	1.13	6.88	6.30	.03	.16				
90% CI	.36	.31	.83	.41	.37	.30	.93	5.66	5.18	.02	.14				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

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TABLE A-A-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	----	------	------	------	------	-----	------	-----	------	------					
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D1	89.38	85.77	86.86	86.87	88.77	75.32	78.78	28.50	29.00	.00	1.90	28	26	35	34
D2	89.12	85.81	86.77	87.73	89.51	74.94	80.40	30.50	29.50	.04	1.78	20	34	35	33
Avg.	89.25	85.79	86.82	87.30	89.14	75.13	79.59	29.50	29.25	.02	1.84				
Std Dv	.18	.03	.06	.61	.52	.27	1.15	1.41	.35	.03	.08				
90% CI	.82	.13	.27	2.72	2.34	1.20	5.11	6.31	1.58	.13	.38				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D5	88.37	84.77	86.19	85.57	87.31	73.82	77.75	34.50	35.00	.00	1.82	20	26	35	34
D6	87.54	84.28	84.98	85.81	87.55	73.60	79.47	27.50	26.00	.00	1.74	20	26	34	25
Avg.	87.96	84.52	85.59	85.69	87.43	73.71	78.61	31.00	30.50	.00	1.78				
Std Dv	.59	.35	.85	.17	.17	.16	1.22	4.95	6.36	.00	.06				
90% CI	2.62	1.55	3.80	.76	.76	.69	5.43	22.10	28.41	.00	.25				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D7	87.87	84.45	86.16	84.47	86.16	72.69	77.00	44.50	45.00	.00	1.69	20	26	28	35
D8	88.37	84.85	85.98	85.31	87.00	73.19	79.58	38.00	38.00	.00	1.69	23	26	34	35
Avg.	88.12	84.65	86.07	84.89	86.58	72.94	78.29	41.25	41.50	.00	1.69				
Std Dv	.35	.28	.13	.59	.59	.35	1.82	4.60	4.95	.00	.00				
90% CI	1.58	1.26	.59	2.65	2.65	1.58	8.15	20.52	22.10	.00	.00				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D9	88.55	85.03	87.01	84.73	86.27	72.86	77.57	52.00	52.00	.00	1.54	20	26	34	33
D10	89.02	85.48	87.21	85.98	87.62	74.04	80.11	41.50	41.50	.00	1.65	23	26	34	35
Avg.	88.79	85.26	87.11	85.36	86.94	73.45	78.84	46.75	46.75	.00	1.60				
Std Dv	.33	.32	.14	.88	.95	.83	1.80	7.42	7.42	.00	.08				
90% CI	1.48	1.42	.63	3.95	4.26	3.73	8.02	33.15	33.15	.00	.35				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

TABLE A-B-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
APPROACH -- TARGET IAS 40.8 kts															
B15	92.34	89.13	91.90	90.60	92.36	79.47	84.80	35.00	37.00	.02	1.77	20	25	27	28
B16	92.97	90.28	91.12	88.68	90.20	77.95	84.24	41.50	46.00	.13	1.38	25	25	32	27
B17	91.30	87.72	88.12	86.84	88.97	74.85	83.86	42.50	43.00	.13	2.22	20	25	35	32
B18	91.02	87.39	87.57	87.23	89.09	74.20	83.69	43.50	43.00	.13	1.90	20	25	32	33
B19	91.59	88.11	89.26	88.08	89.85	76.96	84.44	34.00	35.00	.30	1.47	20	26	25	27
B20	90.35	86.38	87.76	87.82	89.83	74.97	84.23	38.00	28.50	.00	2.01	20	25	32	33
Avg.	91.59	88.17	89.29	88.21	90.05	76.40	84.21	39.08	38.75	.12	1.79				
Std Dv	.94	1.37	1.83	1.34	1.23	2.07	.40	4.02	6.49	.11	.32				
90% CI	.77	1.13	1.51	1.10	1.01	1.70	.33	3.31	5.34	.09	.26				
TAKEOFF -- TARGET IAS 40.8 kts															
C21	89.61	85.10	84.95	83.31	85.76	70.60	78.82	54.50	53.50	.00	2.44	20	25	33	34
C23	89.17	84.90	85.87	84.77	86.46	72.30	79.29	45.50	45.00	.05	1.64	20	33	35	32
C24	90.16	85.79	86.20	85.40	87.34	72.58	80.26	46.00	40.50	.00	2.09	20	25	33	34
C26	90.25	85.70	86.44	85.49	87.64	72.73	80.10	47.00	45.50	.00	2.15	20	25	33	34
C27	90.90	86.22	86.48	86.06	88.39	73.26	81.33	42.00	38.50	.00	2.37	20	25	33	35
C28	89.71	85.37	86.39	85.87	87.66	73.17	80.82	42.00	41.50	.03	1.76	20	25	33	32
Avg.	89.97	85.51	86.06	85.15	87.21	72.44	80.10	46.17	44.08	.01	2.08				
Std Dv	.60	.49	.59	1.01	.94	.97	.93	4.59	5.33	.02	.32				
90% CI	.50	.40	.48	.83	.78	.80	.77	3.78	4.39	.02	.26				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	83.63	79.75	81.23	83.15	85.36	70.09	78.89	26.00	15.00	.00	2.21	20	25	33	32
A2	83.33	79.32	80.32	83.46	85.48	70.66	80.12	18.50	14.50	.00	2.02	20	25	32	33
A3	84.73	80.68	81.68	84.09	86.09	71.07	79.83	23.00	17.00	.00	2.01	20	25	33	32
A4	83.34	79.30	80.77	83.24	85.79	70.46	79.63	21.50	13.50	.00	2.54	20	25	33	32
A5	84.18	79.80	80.40	83.26	85.42	70.19	79.45	21.00	16.50	.00	2.16	20	25	35	32
A6	83.39	79.16	79.49	83.57	85.50	70.74	79.91	15.00	14.50	.00	1.93	20	25	35	32
Avg.	83.77	79.67	80.65	83.46	85.61	70.53	79.64	20.83	15.17	.00	2.14				
Std Dv	.57	.56	.76	.34	.28	.37	.43	3.78	1.33	.00	.22				
90% CI	.47	.46	.63	.28	.23	.30	.36	3.11	1.09	.00	.18				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-B-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D7	84.56	80.16	80.77	84.53	86.80	71.61	79.40	16.50	14.50	.00	2.36	20	25	33	35
D8	84.73	80.40	81.17	85.22	87.57	72.28	80.15	15.50	14.00	.00	2.35	20	33	25	32
Avg.	84.65	80.28	80.97	84.88	87.18	71.94	79.78	16.00	14.25	.00	2.36				
Std Dv	.12	.17	.28	.49	.54	.47	.53	.71	.35	.00	.01				
90% CI	.54	.76	1.26	2.18	2.43	2.12	2.37	3.16	1.58	.00	.03				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D9	85.01	80.49	81.09	84.00	86.12	70.98	79.59	20.50	17.50	.02	2.12	20	25	32	35
D10	83.66	79.63	80.30	83.30	86.05	70.52	79.68	19.00	14.00	.00	2.75	20	25	32	33
Avg.	84.34	80.06	80.69	83.65	86.09	70.75	79.63	19.75	15.75	.01	2.43				
Std Dv	.95	.61	.56	.49	.05	.33	.06	1.06	2.47	.01	.45				
90% CI	4.26	2.72	2.49	2.21	.22	1.45	.28	4.74	11.05	.06	1.99				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D11	85.19	80.88	81.91	82.94	85.08	70.01	80.45	31.00	25.00	.00	2.14	20	25	32	35
D12	83.51	79.37	80.24	83.25	85.09	70.35	81.77	19.50	17.00	.00	1.83	20	25	33	32
Avg.	84.35	80.13	81.08	83.10	85.08	70.18	81.11	25.25	21.00	.00	1.99				
Std Dv	1.19	1.07	1.18	.22	.01	.24	.93	8.13	5.66	.00	.22				
90% CI	5.30	4.77	5.28	.98	.03	1.07	4.17	36.31	25.26	.00	.98				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D13	87.22	82.72	83.32	84.24	86.34	71.21	81.32	32.50	32.00	.02	2.20	20	25	32	26
D14	84.34	80.02	80.63	83.47	85.90	70.52	81.15	20.50	16.00	.02	2.46	20	25	32	33
Avg.	85.78	81.37	81.97	83.85	86.12	70.86	81.24	26.50	24.00	.02	2.33				
Std Dv	2.04	1.91	1.90	.54	.31	.49	.12	8.49	11.31	.00	.18				
90% CI	9.09	8.52	8.50	2.43	1.39	2.18	.54	37.88	50.51	.00	.82				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation
Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-B-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B15	86.56	84.35	84.48	81.15	82.11	70.25	81.00	53.00	55.50	.00	1.12	19	26	27	23
B16	87.40	85.56	87.84	83.41	85.12	74.08	80.77	47.50	53.50	.00	1.72	28	28	25	26
B17	85.48	83.36	86.38	82.96	83.94	72.96	78.22	44.00	46.00	.17	.80	20	25	28	27
B18	85.63	83.11	84.98	81.69	83.09	71.46	79.34	45.00	53.50	.17	1.40	28	28	25	29
B19	86.26	83.36	84.66	80.94	82.06	69.93	80.60	59.50	61.00	.17	1.43	20	36	35	37
B20	85.56	82.76	83.93	80.73	82.20	69.86	80.19	51.00	53.50	.17	1.47	27	32	33	25
Avg.	86.15	83.75	85.38	81.81	83.09	71.42	80.02	50.00	53.83	.11	1.32				
Std Dv	.75	1.03	1.46	1.12	1.24	1.76	1.06	5.79	4.81	.09	.32				
90% CI	.62	.85	1.20	.92	1.02	1.45	.87	4.76	3.96	.07	.25				
TAKEOFF -- TARGET IAS 40.8 kts															
C21	86.76	83.39	83.94	81.06	82.17	68.96	82.31	63.00	63.00	.07	1.04	23	33	32	36
C23	86.27	82.55	83.71	79.70	81.44	68.18	76.13	71.50	72.00	.01	1.73	23	23	33	26
C24	87.06	83.47	83.95	80.35	82.34	68.42	77.12	71.50	71.00	.00	1.99	23	23	33	32
C26	87.75	83.74	84.55	81.85	83.36	70.08	77.39	56.00	58.50	.07	1.44	23	33	32	34
C27	87.41	83.47	84.33	82.29	84.31	69.67	78.51	58.50	58.50	.07	2.02	23	23	33	32
C28	87.28	83.32	83.51	80.61	82.33	68.89	78.25	58.00	61.50	.00	1.72	23	23	33	32
Avg.	87.09	83.32	84.00	80.98	82.66	69.03	78.29	63.08	64.08	.04	1.66				
Std Dv	.52	.40	.38	.96	1.02	.73	2.15	6.91	6.01	.04	.37				
90% CI	.43	.33	.32	.79	.84	.60	1.77	5.68	4.95	.03	.30				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	82.36	79.45	79.53	79.95	81.43	69.02	77.43	22.50	26.00	.00	1.48	23	33	32	34
A2	82.05	78.96	79.45	78.97	80.95	67.69	75.02	30.00	29.50	.00	2.13	23	23	24	32
A3	82.80	79.99	80.99	80.59	81.93	69.93	77.79	25.50	26.50	.00	1.34	23	26	33	34
A4	81.91	79.04	79.40	78.91	80.84	67.86	75.97	28.50	24.00	.00	2.04	23	23	24	33
A5	82.36	79.64	79.80	79.55	80.98	68.83	78.16	25.00	26.00	.04	1.53	23	33	32	26
A6	81.46	78.43	78.63	79.86	81.75	67.84	75.76	24.00	21.00	.04	1.88	23	23	24	33
Avg.	82.16	79.25	79.63	79.64	81.31	68.53	76.69	25.92	25.50	.01	1.73				
Std Dv	.46	.56	.77	.64	.46	.89	1.27	2.82	2.83	.02	.33				
90% CI	.38	.46	.63	.53	.38	.73	1.05	2.32	2.33	.02	.27				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-B-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D7	83.14	80.63	82.02	80.96	82.32	69.98	78.69	32.00	32.50	.04	1.36	23	26	33	32
D8	83.03	80.51	81.78	80.89	82.75	70.56	76.67	26.50	26.00	.04	1.86	23	32	33	34
Avg.	83.08	80.57	81.90	80.93	82.54	70.27	77.68	29.25	29.25	.04	1.61				
Std Dv	.08	.08	.17	.05	.30	.41	1.43	3.89	4.60	.00	.35				
90% CI	.35	.38	.75	.22	1.36	1.83	6.38	17.36	20.52	.00	1.58				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D9	82.41	79.65	79.55	79.14	80.56	68.17	78.53	27.50	28.50	.06	1.37	32	32	35	23
D10	81.72	78.44	78.32	79.96	81.97	68.01	78.17	21.50	21.00	.00	2.13	23	23	34	33
Avg.	82.07	79.04	78.94	79.55	81.26	68.09	78.35	24.50	24.75	.03	1.75				
Std Dv	.49	.86	.87	.58	1.00	.11	.25	4.24	5.30	.04	.54				
90% CI	2.18	3.82	3.88	2.59	4.45	.51	1.14	18.94	23.68	.19	2.40				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.7Vh															
D11	82.36	79.52	80.34	78.47	79.90	67.44	77.54	39.00	39.50	.00	1.43	23	32	33	34
D12	81.52	78.45	79.63	78.20	79.93	66.51	80.58	41.00	40.00	.04	1.68	23	23	26	24
Avg.	81.94	78.99	79.98	78.33	79.92	66.98	79.06	40.00	39.75	.02	1.55				
Std Dv	.59	.76	.50	.19	.02	.66	2.15	1.41	.35	.03	.18				
90% CI	2.65	3.38	2.25	.85	.09	2.94	9.60	6.31	1.58	.13	.79				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D13	84.09	81.22	82.75	79.14	80.50	68.16	78.23	57.50	58.50	.04	1.36	23	33	32	34
D14	81.58	78.19	78.93	79.16	80.51	67.55	76.38	27.50	28.00	.09	1.27	23	35	32	34
Avg.	82.83	79.71	80.84	79.15	80.51	67.86	77.31	42.50	43.25	.06	1.32				
Std Dv	1.77	2.14	2.70	.01	.01	.43	1.31	21.21	21.57	.04	.06				
90% CI	7.92	9.57	12.04	.06	.03	1.93	5.84	94.71	96.29	.16	.28				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-B-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B15	86.33	83.90	85.79	82.09	82.98	71.48	78.53	54.00	56.00	.02	.87	20	27	26	23
B16	87.75	85.22	87.44	83.70	84.34	72.53	79.38	62.00	66.50	.01	.63	26	26	24	27
B17	86.59	83.76	85.08	81.29	82.74	70.27	77.17	60.50	60.50	.01	1.85	27	25	24	27
B18	86.75	84.03	85.48	80.46	82.10	69.74	78.73	75.00	75.00	.01	1.85	28	25	28	26
B19	86.16	83.23	83.82	81.24	82.19	69.88	78.36	49.50	56.50	.03	.93	26	26	23	32
B20	85.89	82.84	85.03	82.02	82.93	70.64	78.86	55.00	64.00	.03	.90	23	34	32	33
Avg.	86.58	83.83	85.44	81.80	82.88	70.76	78.50	59.33	63.08	.02	1.17				
Std Dv	.65	.82	1.19	1.11	.81	1.07	.74	8.92	7.14	.01	.54				
90% CI	.53	.67	.98	.91	.66	.88	.61	7.34	5.87	.01	.44				
TAKEOFF -- TARGET IAS 40.8 kts															
C21	88.47	85.26	85.97	81.56	82.99	69.87	76.21	81.50	81.00	.03	1.65	23	33	35	32
C23	88.08	84.68	85.18	82.89	84.59	70.48	77.28	59.00	58.00	.03	1.69	23	23	35	33
C24	88.50	85.05	85.56	82.10	83.81	70.09	81.19	70.50	70.50	.03	1.74	23	23	33	35
C26	88.75	85.08	86.14	83.38	85.11	71.33	76.30	60.50	67.00	.03	1.73	20	33	32	34
C27	89.59	85.88	87.59	86.30	88.20	73.52	78.16	51.00	46.50	.01	1.89	23	35	33	32
C28	88.01	84.55	85.45	82.88	84.66	70.94	79.55	56.50	55.50	.01	2.13	20	33	32	34
Avg.	88.57	85.08	85.98	83.18	84.89	71.04	78.11	63.17	63.08	.02	1.80				
Std Dv	.57	.47	.86	1.66	1.78	1.33	1.96	11.02	12.25	.01	.18				
90% CI	.47	.39	.71	1.36	1.47	1.09	1.61	9.06	10.07	.01	.15				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	82.71	79.78	80.69	80.30	81.96	68.86	75.92	30.50	30.50	.00	1.66	20	32	26	34
A2	82.08	79.45	79.44	80.87	82.29	69.78	78.78	18.50	19.00	.00	1.41	23	32	33	34
A3	82.67	79.95	81.21	80.30	81.61	69.10	74.77	32.50	32.50	.01	1.30	23	32	26	33
A4	82.08	79.32	79.51	81.30	82.81	69.97	77.95	18.00	18.00	.00	1.51	23	32	33	34
A5	82.59	79.71	80.56	80.07	81.21	68.87	75.47	29.50	30.00	.03	1.11	23	32	33	34
A6	81.37	78.80	79.51	81.14	82.63	69.62	78.58	19.50	19.00	.03	1.52	23	33	32	34
Avg.	82.25	79.50	80.15	80.66	82.08	69.37	76.91	24.75	24.83	.01	1.42				
Std Dv	.52	.41	.76	.51	.61	.48	1.73	6.75	6.82	.01	.19				
90% CI	.43	.34	.63	.42	.50	.40	1.42	5.55	5.61	.01	.16				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-B-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D7	83.48	80.75	81.70	80.49	81.89	69.33	75.26	34.50	33.50	.00	1.39	23	32	26	33
D8	82.31	79.59	80.33	82.41	83.72	70.44	78.82	19.50	19.50	.00	1.35	23	33	32	35
Avg.	82.90	80.17	81.01	81.45	82.81	69.89	77.04	27.00	26.50	.00	1.37				
Std Dv	.83	.82	.97	1.36	1.29	.78	2.52	10.61	9.90	.00	.03				
90% CI	3.69	3.66	4.32	6.06	5.78	3.50	11.24	47.35	44.20	.00	.13				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D9	82.53	79.78	80.90	80.52	81.84	69.07	74.39	30.50	30.50	.00	1.32	20	32	35	33
D10	81.91	79.13	79.66	80.77	81.89	70.00	79.08	18.50	23.50	.01	1.10	23	33	32	34
Avg.	82.22	79.46	80.28	80.64	81.86	69.54	76.74	24.50	27.00	.00	1.21				
Std Dv	.44	.46	.88	.18	.04	.66	3.32	8.49	4.95	.01	.16				
90% CI	1.96	2.05	3.92	.79	.16	2.94	14.81	37.88	22.10	.03	.69				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D11	83.26	80.19	82.23	80.27	81.69	68.86	74.78	43.50	44.00	.00	1.42	20	32	33	35
D12	81.01	78.26	77.86	79.40	80.92	67.65	79.90	21.00	21.00	.01	1.51	23	33	32	34
Avg.	82.14	79.23	80.05	79.83	81.31	68.26	77.34	32.25	32.50	.00	1.46				
Std Dv	1.59	1.36	3.09	.62	.54	.86	3.62	15.91	16.26	.01	.06				
90% CI	7.10	6.09	13.80	2.75	2.43	3.82	16.16	71.03	72.61	.03	.28				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D13	84.98	81.87	83.57	79.68	80.67	68.32	76.17	67.00	68.00	.03	.96	23	32	34	33
D14	81.50	78.61	79.34	81.50	82.92	70.05	80.09	17.00	19.50	.02	1.40	23	32	33	23
Avg.	83.24	80.24	81.46	80.59	81.79	69.18	78.13	42.00	43.75	.02	1.18				
Std Dv	2.46	2.31	2.99	1.29	1.59	1.22	2.77	35.36	34.29	.01	.31				
90% CI	10.99	10.29	13.34	5.75	7.10	5.46	12.38	157.85	153.11	.03	1.39				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-C-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMAPY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B18	92.42	90.65	91.04	93.61	94.66	82.59	87.58	14.00	14.50	.00	1.05	22	25	28	26
B20	92.06	90.21	91.26	93.53	94.60	82.23	87.79	16.00	13.00	.10	.97	22	25	28	26
B21	91.74	89.90	89.82	91.84	92.84	81.22	86.85	14.50	15.00	.06	.94	20	25	24	26
B22	90.60	88.86	89.74	92.30	93.32	81.96	86.42	12.00	13.00	.06	1.02	20	25	26	28
B23	90.90	89.01	89.84	91.24	92.27	80.68	86.97	16.50	16.50	.00	1.03	22	25	24	22
B24	91.38	89.67	90.28	92.10	93.23	81.25	87.06	16.00	16.50	.00	1.27	20	25	27	26
Avg.	91.52	89.72	90.33	92.44	93.49	81.65	87.11	14.83	14.75	.04	1.05				
Std Dv	.69	.69	.67	.95	.96	.72	.50	1.69	1.57	.04	.12				
90% CI	.57	.57	.55	.78	.79	.59	.41	1.39	1.29	.04	.10				
TAKEOFF -- TARGET IAS 40.8 kts															
C25	86.81	82.68	83.76	87.09	88.72	73.98	79.23	19.00	17.00	.00	1.63	20	33	35	32
C26	87.35	83.16	83.62	86.73	88.61	73.73	79.26	19.50	18.00	.00	1.99	20	33	35	32
C27	87.69	83.64	83.95	86.49	88.16	73.54	80.15	22.00	21.50	.00	1.67	20	33	35	32
C28	87.94	83.72	84.26	89.06	90.68	75.51	80.14	15.00	13.00	.00	1.62	20	35	33	34
C29	87.20	82.99	83.44	87.17	88.46	73.78	78.85	18.50	18.50	.04	1.26	20	35	33	32
C30	87.81	83.80	84.28	87.65	89.21	74.62	79.77	18.50	17.00	.04	1.56	20	33	35	32
Avg.	87.47	83.33	83.89	87.36	88.97	74.19	79.57	18.75	17.50	.01	1.62				
Std Dv	.43	.46	.34	.92	.90	.74	.54	2.25	2.76	.02	.23				
90% CI	.35	.37	.28	.76	.74	.61	.44	1.85	2.27	.02	.19				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	81.64	77.85	78.65	82.16	84.02	69.23	77.46	17.50	14.00	.00	1.86	20	33	35	34
A2	83.25	79.23	79.42	82.77	84.67	69.88	78.07	18.00	16.50	.00	1.91	20	35	33	32
A3	81.60	77.62	77.87	81.92	83.74	69.12	77.49	15.00	14.50	.00	1.82	20	33	35	34
A4	83.16	79.35	81.85	83.23	85.20	70.24	78.25	29.00	21.00	.00	1.97	20	33	35	32
A5	81.67	78.05	79.55	82.41	84.15	69.89	78.32	18.50	13.50	.00	1.74	20	35	25	32
A7	83.70	79.82	81.68	83.67	85.63	70.80	78.65	24.50	18.50	.10	1.96	20	33	35	32
Avg.	82.50	78.65	79.84	82.69	84.57	69.86	78.04	20.42	16.33	.02	1.38				
Std Dv	.97	.92	1.61	.66	.73	.63	.48	5.25	2.94	.04	.09				
90% CI	.80	.76	1.33	.55	.60	.52	.39	4.32	2.42	.03	.07				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-C-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR
(25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY	BNDS	
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts --1.0Vh															
D8	82.71	78.41	79.55	83.97	85.61	70.95	76.90	14.50	13.00	.10	1.64	20	35	33	34
D9	83.80	79.72	80.72	85.43	87.10	72.27	78.23	14.00	12.00	.10	1.67	20	33	35	32
Avg.	83.26	79.07	80.14	84.70	86.35	71.61	77.57	14.25	12.50	.10	1.65				
Std Dv	.77	.93	.83	1.03	1.05	.93	.94	.35	.71	.00	.02				
90% CI	3.44	4.14	3.69	4.61	4.70	4.17	4.20	1.58	3.16	.00	.09				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D10	81.84	77.82	78.32	81.74	83.68	69.29	78.25	16.00	15.00	.10	2.43	20	32	33	35
D11	83.21	79.30	80.06	81.93	83.90	69.18	78.13	24.50	19.00	.10	1.97	20	33	35	32
Avg.	82.52	78.56	79.19	81.83	83.79	69.24	78.19	20.25	17.00	.10	2.20				
Std Dv	.97	1.05	1.23	.13	.16	.08	.08	6.01	2.83	.00	.33				
90% CI	4.33	4.67	5.49	.60	.69	.35	.38	26.83	12.63	.00	1.45				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D12	81.67	77.73	78.20	81.33	83.04	68.42	79.47	19.00	18.50	.10	1.71	20	32	33	35
D13	83.48	79.54	80.07	82.05	83.82	69.37	79.82	23.50	23.00	.10	1.78	20	32	33	35
Avg.	82.57	78.64	79.13	81.69	83.43	68.90	79.65	21.25	20.75	.10	1.75				
Std Dv	1.28	1.28	1.32	.51	.55	.67	.25	3.18	3.18	.00	.05				
90% CI	5.71	5.71	5.91	2.27	2.46	3.00	1.10	14.21	14.21	.00	.22				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D14	82.11	78.29	79.40	81.92	83.49	69.19	79.54	21.00	19.50	.10	1.57	20	25	35	32
D16	84.37	80.40	81.80	82.45	84.42	69.50	79.90	34.00	27.50	.00	1.97	20	33	35	32
Avg.	83.24	79.35	80.60	82.18	83.96	69.35	79.72	27.50	23.50	.05	1.77				
Std Dv	1.60	1.49	1.70	.37	.66	.22	.25	9.19	5.66	.07	.28				
90% CI	7.13	6.66	7.58	1.67	2.94	.98	1.14	41.04	25.26	.32	1.26				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-C-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B18	86.30	84.34	85.75	86.19	87.18	75.54	80.04	21.00	23.50	.03	.99	22	26	27	28
B20	87.36	85.63	88.44	88.64	90.33	78.33	80.82	20.50	20.50	.00	1.68	27	27	28	29
B21	85.87	83.73	85.01	85.20	86.79	74.90	78.56	20.50	23.00	.00	1.58	27	27	26	28
B22	87.69	85.43	87.16	87.81	89.31	77.16	80.98	20.00	22.50	.02	1.48	27	27	28	34
B23	86.55	84.14	85.80	84.78	85.98	74.26	79.10	28.50	30.50	.00	1.21	28	28	29	33
B24	86.77	84.90	85.45	85.51	86.65	75.24	79.48	21.00	22.50	.08	1.10	22	27	28	26
Avg.	86.76	84.69	86.27	86.36	87.71	75.90	79.83	21.92	23.75	.02	1.34				
Std Dv	.67	.75	1.28	1.54	1.71	1.53	.96	3.25	3.46	.03	.28				
90% CI	.55	.62	1.06	1.27	1.41	1.26	.79	2.67	2.85	.03	.23				
TAKEOFF -- TARGET IAS 40.8 kts															
C25	83.17	79.19	79.04	80.35	82.00	67.90	77.14	26.00	25.50	.00	2.05	20	35	33	34
C26	83.78	80.04	80.31	81.34	83.09	68.48	78.49	30.50	30.00	.00	1.90	20	33	32	35
C27	84.31	80.48	81.09	81.51	83.90	69.19	78.23	31.00	31.00	.00	2.39	20	33	32	34
C28	84.41	80.55	80.96	82.59	83.78	69.74	78.90	26.50	26.00	.00	2.38	20	35	33	32
C29	83.33	79.60	80.12	80.47	81.65	68.22	77.91	31.00	30.50	.00	1.75	20	33	32	34
C30	84.45	80.65	81.48	82.46	84.23	69.51	76.91	31.50	26.50	.06	1.71	20	35	33	32
Avg.	83.91	80.08	80.50	81.45	83.11	68.84	77.93	29.42	28.25	.01	2.03				
Std Dv	.57	.59	.88	.95	1.07	.75	.78	2.48	2.50	.02	.30				
90% CI	.47	.48	.72	.78	.88	.61	.64	2.04	2.06	.02	.25				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	80.11	77.21	78.04	79.03	80.17	67.53	77.41	22.50	22.50	.00	1.14	23	33	32	34
A2	81.16	78.05	78.28	79.32	80.43	67.22	74.76	25.50	24.50	.05	1.07	23	35	33	32
A3	79.98	76.86	77.86	79.31	80.46	67.35	76.85	22.50	19.00	.05	1.15	23	33	32	34
A4	81.20	78.19	79.01	80.56	81.71	68.31	74.14	23.50	20.50	.05	1.15	23	33	35	32
A5	80.11	76.90	77.08	79.61	80.74	67.66	77.62	17.50	17.50	.05	1.13	23	33	32	34
A7	81.80	78.60	79.54	80.12	81.13	67.93	75.32	29.00	28.00	.05	1.15	20	33	32	35
Avg.	80.73	77.64	78.30	79.66	80.77	67.67	76.02	23.42	22.00	.04	1.13				
Std Dv	.76	.74	.87	.58	.56	.40	1.47	3.80	3.85	.02	.03				
90% CI	.62	.61	.72	.47	.46	.33	1.21	3.13	3.16	.02	.03				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-C-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D8	81.22	77.83	78.11	80.07	81.33	67.90	76.94	21.00	20.50	.05	1.58	20	32	33	34
D9	83.01	79.56	79.60	81.17	82.34	68.54	75.74	25.50	25.00	.05	1.45	23	35	34	33
Avg.	82.12	78.69	78.85	80.62	81.83	68.22	76.34	23.25	22.75	.05	1.52				
Std Dv	1.27	1.22	1.05	.78	.71	.45	.85	3.18	3.18	.00	.09				
90% CI	5.65	5.46	4.68	3.47	3.19	2.02	3.79	14.21	14.21	.00	.41				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D10	79.97	76.75	76.85	78.41	79.56	66.44	76.46	22.00	22.50	.05	1.24	23	32	33	34
D11	81.07	77.79	79.65	79.43	80.57	67.16	74.80	35.50	34.50	.03	1.10	23	32	33	35
Avg.	80.52	77.27	78.25	78.92	80.07	66.80	75.63	28.75	28.50	.04	1.17				
Std Dv	.78	.74	1.98	.72	.71	.51	1.17	9.55	8.49	.01	.10				
90% CI	3.47	3.28	8.83	3.22	3.19	2.27	5.24	42.62	37.88	.06	.44				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D12	80.51	77.16	78.19	79.01	79.94	66.97	78.42	26.50	26.50	.03	.93	20	33	32	26
D13	80.44	77.33	78.84	77.74	78.72	65.32	74.70	45.00	43.00	.03	.97	20	32	34	26
Avg.	80.48	77.25	78.52	78.38	79.33	66.15	76.56	35.75	34.75	.03	.95				
Std Dv	.05	.12	.46	.90	.86	1.17	2.63	13.08	11.67	.00	.03				
90% CI	.22	.54	2.05	4.01	3.85	5.21	11.74	58.40	52.09	.00	.13				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D14	80.00	76.71	77.32	78.05	78.98	65.71	77.27	29.00	29.50	.03	.93	26	32	34	33
D16	81.78	78.58	79.67	78.04	79.09	65.82	75.44	48.50	48.00	.03	1.05	26	32	26	35
Avg.	80.89	77.65	78.50	78.04	79.04	65.76	76.35	38.75	38.75	.03	.99				
Std Dv	1.26	1.32	1.66	.01	.08	.08	1.29	13.79	13.08	.00	.08				
90% CI	5.62	5.90	7.40	.03	.35	.35	5.78	61.56	58.40	.00	.38				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation

Volpe Center Acoustics Facility

May 6, 1993

TABLE A-C-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX NOY BNDS (#)		
APPROACH -- TARGET IAS 40.8 kts															
B18	84.33	81.85	82.44	83.06	84.27	70.90	77.85	28.50	22.00	.03	1.72	27	24	27	23
B20	84.47	81.77	81.90	83.06	83.97	70.76	77.75	26.00	26.00	.03	.91	22	24	23	26
B21	83.63	81.04	81.71	82.74	83.35	70.41	77.68	27.00	26.00	.03	.61	23	23	24	26
B22	84.10	81.47	81.84	83.61	84.33	71.33	78.38	22.50	19.50	.03	.72	24	24	23	26
B23	83.97	81.57	82.10	81.90	83.33	70.13	76.78	31.50	30.00	.00	2.00	27	24	27	23
B24	83.02	80.61	81.82	82.91	83.66	70.76	77.62	25.50	22.50	.05	.70	23	23	24	26
Avg.	83.92	81.39	81.97	82.88	83.82	70.72	77.68	26.83	24.33	.03	1.11				
Std Dv	.53	.47	.26	.56	.44	.41	.52	3.03	3.74	.02	.60				
90% CI	.44	.39	.22	.46	.36	.34	.43	2.49	3.07	.01	.49				
TAKEOFF -- TARGET IAS 40.8 kts															
C25	85.43	81.81	82.50	83.74	84.92	71.53	75.22	25.00	24.50	.14	1.04	23	32	33	34
C26	85.35	81.76	82.28	84.35	85.52	72.17	75.37	20.50	19.50	.19	.98	20	32	34	33
C27	85.58	81.99	82.54	84.48	85.79	71.32	76.23	26.50	23.00	.19	1.32	35	35	33	34
C28	86.00	81.97	83.31	86.97	88.49	73.89	76.69	17.50	13.50	.19	1.52	27	35	33	34
C29	85.48	82.03	82.46	84.30	85.37	71.24	75.27	26.50	21.00	.01	1.06	23	35	33	34
C30	87.18	83.65	84.21	86.47	88.30	74.32	77.34	19.50	18.50	.02	1.81	20	33	32	35
Avg.	85.84	82.20	82.88	85.05	86.40	72.41	76.02	22.58	20.00	.12	1.29				
Std Dv	.70	.72	.74	1.33	1.57	1.36	.88	3.90	3.87	.09	.33				
90% CI	.57	.59	.61	1.09	1.29	1.12	.72	3.21	3.19	.07	.27				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	80.48	77.46	78.46	80.78	81.79	68.25	74.24	21.00	19.50	.02	.99	23	35	32	33
A2	81.88	78.79	79.45	81.11	82.34	68.66	78.13	24.00	24.00	.02	1.23	20	33	35	34
A3	79.80	76.75	77.91	79.33	80.35	67.12	73.05	24.00	24.50	.08	.94	20	33	32	35
A4	81.25	78.14	78.56	80.62	81.68	68.15	77.60	22.00	22.00	.05	1.01	23	33	35	32
A5	80.06	77.03	77.69	80.26	81.15	67.69	73.59	20.00	19.50	.05	.90	20	33	35	32
A7	82.35	79.20	80.11	81.15	82.49	68.57	78.26	28.50	27.00	.05	1.34	20	33	35	32
Avg.	80.97	77.89	78.70	80.54	81.63	68.07	75.81	23.25	22.75	.05	1.07				
Std Dv	1.02	.98	.92	.68	.79	.58	2.43	3.03	2.98	.02	.18				
90% CI	.84	.81	.76	.56	.65	.48	2.00	2.49	2.45	.02	.14				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= S plified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation

Volpe Center
Acoustics Facility

TABLE A-C-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR
(25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D8	81.43	78.17	79.62	81.41	82.56	68.74	73.62	24.50	23.00	.05	1.15	20	33	35	34
D9	83.21	80.13	83.36	82.61	83.64	70.04	78.45	43.00	42.00	.05	1.03	23	33	32	35
Avg.	82.32	79.15	81.49	82.01	83.10	69.39	76.04	33.75	32.50	.05	1.09				
Std Dv	1.26	1.39	2.65	.85	.76	.92	3.42	13.08	13.44	.00	.08				
90% CI	5.62	6.19	11.82	3.79	3.41	4.10	15.25	58.40	59.98	.00	.38				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D10	80.32	76.93	77.55	79.32	80.58	66.94	73.74	23.00	22.50	.13	1.14	20	35	33	32
D11	82.00	78.84	80.30	80.23	81.53	67.57	76.83	37.50	35.50	.13	1.30	20	33	32	35
Avg.	81.16	77.88	78.92	79.78	81.06	67.26	75.29	30.25	29.00	.13	1.22				
Std Dv	1.19	1.35	1.95	.64	.67	.45	2.18	10.25	9.19	.00	.11				
90% CI	5.30	6.03	8.69	2.87	3.00	1.99	9.76	45.78	41.04	00	.51				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D12	79.98	76.58	78.25	79.91	81.19	67.46	72.76	24.00	23.50	.02	1.27	20	32	35	33
D13	80.94	78.01	79.16	80.17	81.20	67.40	77.13	30.00	28.00	.02	1.03	25	33	34	32
Avg.	80.46	77.29	78.71	80.04	81.19	67.43	74.94	27.00	25.75	.02	1.15				
Std Dv	.68	1.01	.64	.18	.01	.04	3.09	4.24	3.18	.00	.17				
90% CI	3.03	4.51	2.87	.82	.03	.19	13.80	18.94	14.21	.00	.76				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D14	80.16	76.66	77.83	78.92	80.21	66.53	72.56	27.00	27.50	.02	1.32	20	32	35	34
D16	82.45	79.36	81.23	79.40	80.83	67.00	78.65	53.00	51.50	.03	1.40	20	33	32	34
Avg.	81.31	78.01	79.53	79.16	80.52	66.76	75.60	40.00	39.50	.02	1.36				
Std Dv	1.62	1.91	2.40	.34	.44	.33	4.31	18.38	16.97	.01	.06				
90% CI	7.23	8.52	10.73	1.52	1.96	1.48	19.23	82.08	75.77	.03	.25				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-D-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B16	91.82	90.25	91.37	92.29	93.24	81.59	86.00	19.00	18.50	.10	.86	25	25	28	26
B17	92.81	91.41	92.34	93.06	94.06	82.03	87.33	21.50	19.50	.06	.94	24	25	24	28
B18	92.61	91.09	91.73	92.46	93.55	81.73	86.88	20.00	18.50	.06	1.08	22	25	26	28
B20	89.86	88.05	88.82	89.88	90.85	78.51	85.80	21.50	20.50	.01	.97	25	25	27	22
B21	88.95	86.60	86.65	88.87	89.65	77.11	85.03	18.00	18.00	.01	.89	21	22	25	24
B22	90.53	88.76	89.39	90.43	91.52	80.23	85.29	16.50	17.00	.07	1.02	22	26	25	24
Avg.	91.10	89.36	90.05	91.17	92.14	80.20	86.06	19.42	18.67	.05	.96				
Std Dv	1.56	1.88	2.16	1.67	1.74	2.00	.90	1.99	1.21	.04	.08				
90% CI	1.29	1.55	1.78	1.38	1.43	1.65	.74	1.63	1.00	.03	.07				
TAKEOFF -- TARGET IAS 40.8 kts															
C24	85.83	82.71	82.84	84.78	86.20	72.73	79.21	20.50	20.00	.07	1.42	20	34	33	32
C25	84.83	81.67	81.71	83.48	85.17	71.30	79.33	22.00	21.00	.07	1.68	20	34	32	33
C26	85.77	82.67	82.74	85.26	86.95	73.08	79.05	18.50	18.50	.07	1.69	20	33	32	34
C27	85.78	82.63	82.99	84.58	86.25	72.29	79.46	23.50	22.50	.07	1.66	20	34	33	32
C28	85.30	82.41	83.18	84.38	85.87	71.96	79.14	26.50	20.50	.07	1.50	20	34	33	35
C29	85.31	82.15	82.32	83.39	84.88	71.26	77.79	25.50	24.50	.07	2.16	20	33	32	34
Avg.	85.47	82.37	82.63	84.31	85.89	72.10	79.00	22.75	21.17	.07	1.68				
Std Dv	.39	.40	.53	.74	.76	.74	.61	3.03	2.09	.00	.26				
90% CI	.32	.33	.44	.61	.63	.61	.50	2.49	1.72	.00	.21				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	79.07	76.07	77.15	78.85	80.39	66.74	76.90	22.00	20.50	.00	1.87	20	34	33	32
A2	81.04	77.84	77.84	80.96	83.10	68.55	77.50	17.00	15.50	.00	2.14	20	34	33	35
A3	78.46	75.53	77.02	80.09	81.64	67.73	77.35	17.00	12.00	.00	1.80	20	34	33	32
A4	78.89	75.96	75.89	78.41	80.03	66.60	75.52	17.00	16.00	.14	1.47	20	34	33	25
A5	79.11	76.23	77.58	80.08	81.73	67.80	77.39	19.00	17.50	.14	1.65	20	34	33	35
A6	80.08	77.12	77.71	79.93	81.20	67.71	77.33	20.00	19.50	.14	1.27	20	34	32	33
Avg.	79.44	76.46	77.20	79.72	81.35	67.52	77.00	18.67	16.83	.07	1.70				
Std Dv	.95	.86	.71	.93	1.09	.73	.75	2.07	3.06	.08	.31				
90% CI	.78	.70	.59	.76	.90	.60	.62	1.70	2.52	.06	.25				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-D-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D7	80.08	77.27	78.49	80.48	81.98	68.60	76.71	19.50	17.00	.01	1.49	20	34	33	32
D9	81.38	78.16	78.56	81.16	82.93	68.90	77.35	18.50	17.50	.01	2.19	20	33	32	34
Avg.	80.73	77.71	78.53	80.82	82.46	68.75	77.03	19.00	17.25	.01	1.84				
Std Dv	.92	.63	.05	.48	.67	.21	.45	.71	.35	.00	.49				
90% CI	4.10	2.81	.23	2.15	3.00	.95	2.02	3.16	1.58	.00	2.21				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D10	78.31	75.53	75.99	78.76	80.27	66.57	77.78	17.50	13.00	.01	1.88	20	34	32	33
D11	79.70	77.03	77.92	78.73	80.35	66.95	77.04	25.00	17.50	.01	1.62	20	34	33	32
Avg.	79.00	76.28	76.95	78.75	80.31	66.76	77.41	21.25	15.25	.01	1.75				
Std Dv	.98	1.06	1.36	.02	.06	.27	.52	5.30	3.18	.00	.18				
90% CI	4.39	4.74	6.09	.09	.25	1.20	2.34	23.68	14.21	.00	.82				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D12	79.77	76.87	78.40	79.65	81.00	67.99	78.57	22.00	21.50	.10	1.25	20	34	25	35
D13	80.71	77.68	78.69	79.47	81.18	67.55	78.85	26.00	22.50	.10	2.03	20	34	33	32
Avg.	80.24	77.28	78.55	79.56	81.09	67.77	78.71	24.00	22.00	.10	1.64				
Std Dv	.66	.57	.20	.13	.13	.31	.20	2.83	.71	.00	.55				
90% CI	2.97	2.56	.90	.57	.57	1.39	.88	12.63	3.16	.00	2.46				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D14	79.67	76.61	77.06	78.38	79.91	66.75	78.78	21.50	22.00	.10	1.65	25	34	32	33
D15	81.78	78.72	79.45	79.12	81.21	67.28	79.29	33.00	28.50	.10	2.08	20	34	32	33
Avg.	80.72	77.67	78.26	78.75	80.56	67.01	79.04	27.25	25.25	.10	1.87				
Std Dv	1.49	1.49	1.69	.52	.92	.37	.36	8.13	4.60	.00	.30				
90% CI	6.66	6.66	7.55	2.34	4.10	1.67	1.61	36.31	20.52	.00	1.36				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-D-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND DIRECTED EXHAUST
4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B16	86.91	85.24	86.33	86.12	87.93	76.02	79.94	21.50	21.00	.00	1.82	27	27	28	26
B17	87.45	86.18	87.11	87.18	88.30	76.70	81.53	22.00	20.00	.00	1.12	19	26	27	28
B18	86.72	85.33	85.40	86.31	87.23	75.98	80.47	17.50	18.00	.00	.92	26	26	28	27
B20	83.75	82.04	83.95	84.08	85.41	74.29	78.20	18.50	20.00	.03	1.30	27	27	29	33
B21	83.75	81.61	81.52	81.61	82.46	71.41	79.57	20.50	29.50	.00	1.70	27	27	33	29
B22	84.05	82.39	82.32	83.40	84.25	72.78	78.93	18.00	18.50	.04	.81	19	26	23	28
Avg.	85.44	83.80	84.44	84.78	85.93	74.53	79.77	19.67	21.17	.01	1.28				
Std Dv	1.76	2.00	2.23	2.11	2.30	2.09	1.17	1.91	4.23	.02	.41				
90% CI	1.45	1.64	1.84	1.74	1.89	1.72	.96	1.58	3.48	.02	.34				
TAKEOFF -- TARGET IAS 40.8 kts															
C24	80.96	78.67	79.48	77.88	79.56	67.05	76.99	35.00	35.50	.04	1.98	27	34	33	27
C25	80.47	78.34	79.36	78.82	80.62	67.53	77.31	30.50	25.50	.04	1.80	27	34	33	32
C26	80.31	77.88	79.22	77.79	79.73	66.85	76.49	34.50	34.00	.04	2.00	27	34	33	32
C27	81.37	79.07	79.67	78.51	80.48	66.88	76.75	38.00	31.50	.04	1.97	27	34	33	32
C28	80.96	78.62	79.54	78.34	80.00	67.30	77.07	33.50	33.00	.04	1.75	27	34	35	33
C29	80.90	78.46	79.32	78.62	79.40	67.42	75.99	31.00	33.50	.00	.78	23	33	32	34
Avg.	80.83	78.51	79.43	78.33	79.97	67.17	76.77	33.75	32.17	.03	1.71				
Std Dv	.38	.39	.16	.41	.50	.29	.47	2.77	3.52	.02	.47				
90% CI	.31	.32	.13	.34	.41	.24	.39	2.28	2.89	.01	.39				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	76.43	73.90	74.58	75.37	76.38	63.79	77.35	24.00	23.50	.07	1.87	19	34	33	35
A2	78.76	77.03	77.90	78.40	78.40	66.36	74.38	28.50	26.00	.00	.00	26	34	33	35
A3	76.77	74.37	75.16	76.51	77.40	64.75	77.58	22.00	21.50	.07	1.20	19	34	33	35
A4	78.19	75.72	76.50	77.42	78.22	65.62	73.88	24.50	24.50	.07	.80	23	34	33	26
A5	77.34	74.72	75.02	78.18	79.06	65.99	77.92	16.00	16.00	.07	.88	23	34	33	35
A6	78.97	76.16	76.80	77.92	78.83	65.74	74.29	25.50	25.00	.07	.91	23	34	33	35
Avg.	77.74	75.32	75.99	77.30	78.05	65.37	75.90	23.42	22.75	.06	.94				
Std Dv	1.06	1.19	1.28	1.16	1.00	.94	1.90	4.21	3.64	.03	.61				
90% CI	.87	.98	1.05	.95	.82	.78	1.56	3.46	3.00	.02	.50				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-D-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX NOY BNDS (#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D7	77.80	75.38	77.06	79.43	80.48	67.90	77.50	16.50	15.50	.00	1.06	23	34	33	35
D9	79.85	77.61	78.85	78.34	79.18	66.88	74.90	31.50	30.50	.07	1.42	23	33	34	23
Avg.	78.82	76.49	77.96	78.88	79.83	67.39	76.20	24.00	23.00	.04	1.24				
Std Dv	1.45	1.58	1.26	.77	.92	.72	1.84	10.61	10.61	.05	.25				
90% CI	6.47	7.04	5.65	3.44	4.10	3.22	8.21	47.35	47.35	.22	1.14				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D10	76.04	74.31	75.18	75.23	76.04	64.67	77.10	22.50	23.00	.07	1.28	19	34	26	33
D11	77.84	75.80	76.55	76.11	76.76	64.79	74.35	30.00	30.00	.07	.79	23	34	33	26
Avg.	76.94	75.06	75.87	75.67	76.40	64.73	75.72	26.25	26.50	.07	1.03				
Std Dv	1.27	1.05	.97	.62	.51	.08	1.94	5.30	4.95	.00	.35				
90% CI	5.68	4.70	4.32	2.78	2.27	.38	8.68	23.68	22.10	.00	1.55				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D12	76.37	74.33	75.43	74.89	75.50	63.82	76.65	29.00	28.50	.04	.57	26	34	33	32
D13	78.67	76.43	77.52	76.97	77.97	65.28	74.48	33.50	29.50	.00	.99	23	34	33	35
Avg.	77.52	75.38	76.48	75.93	76.74	64.55	75.57	31.25	29.00	.02	.78				
Std Dv	1.63	1.48	1.48	1.47	1.75	1.03	1.53	3.18	.71	.03	.30				
90% CI	7.26	6.63	6.59	6.57	7.80	4.61	6.85	14.21	3.16	.13	1.33				
150 m FLYOVER -- TARGET IS 48.0 kts -- 0.6Vh															
D14	77.13	75.03	75.70	75.44	76.32	64.40	76.94	27.00	29.00	.00	.88	19	33	32	34
D15	79.74	77.27	77.80	76.81	77.80	65.13	74.93	37.00	36.50	.00	.99	23	34	33	35
Avg.	78.43	76.15	76.75	76.13	77.06	64.76	75.93	32.00	32.75	.00	.94				
Std Dv	1.85	1.58	1.48	.97	1.05	.52	1.42	7.07	5.30	.00	.08				
90% CI	8.24	7.07	6.62	4.33	4.67	2.30	6.35	31.57	23.68	.00	.35				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-D-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
APPROACH -- TARGET IAS 40.8 kts															
B16	84.88	82.80	84.05	82.71	83.62	70.88	77.93	41.50	28.50	.00	.91	22	24	26	23
B17	85.24	83.19	84.03	83.83	84.79	72.13	78.86	31.00	28.50	.00	.97	26	23	26	24
B18	84.84	82.57	82.66	83.13	83.96	71.20	78.32	28.00	26.50	.10	.73	24	24	23	26
B20	84.33	82.66	84.16	82.88	83.68	71.61	77.08	36.00	26.50	.01	.80	26	26	24	34
B21	83.88	81.71	82.19	81.84	82.62	71.05	76.89	26.00	26.00	.01	.90	19	26	23	24
B22	84.13	81.88	82.10	83.37	84.47	71.13	78.38	25.00	21.00	.01	1.10	23	23	26	24
Avg.	84.55	82.47	83.20	82.96	83.86	71.33	77.91	31.25	26.17	.02	.90				
Std Dv	.52	.57	.99	.67	.76	.46	.78	6.40	2.75	.04	.13				
90% CI	.43	.47	.81	.56	.62	.38	.64	5.27	2.26	.03	.11				
TAKEOFF -- TARGET IAS 40.8 kts															
C24	84.12	81.37	81.21	80.51	82.16	68.91	74.13	34.00	29.50	.01	1.68	27	35	34	33
C25	83.81	81.07	80.43	80.76	81.94	68.74	74.14	29.50	29.50	.01	1.19	23	33	34	32
C26	84.01	81.24	82.07	82.40	83.37	70.69	74.69	27.50	27.50	.01	.96	20	33	34	32
C27	83.88	81.13	81.61	81.56	82.54	69.85	74.73	30.00	30.00	.01	1.13	20	33	34	32
C28	84.39	81.53	81.31	81.39	82.89	69.34	74.46	31.50	30.00	.01	1.57	27	35	34	36
C29	83.82	80.98	81.42	81.27	82.42	69.52	73.69	31.00	30.00	.00	1.15	23	33	34	32
Avg.	84.01	81.22	81.34	81.31	82.55	69.51	74.31	30.58	29.42	.01	1.28				
Std Dv	.22	.20	.54	.66	.52	.71	.40	2.18	.97	.00	.28				
90% CI	.18	.17	.45	.55	.42	.58	.33	1.79	.80	.00	.23				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	77.87	75.25	76.40	78.27	78.91	66.19	73.76	21.00	21.00	.00	.64	20	34	33	35
A2	78.41	76.02	76.86	77.63	78.62	65.72	77.55	26.00	25.50	.08	.91	23	34	35	33
A3	78.34	75.75	75.92	77.22	77.94	65.71	74.24	21.00	21.00	.08	1.51	19	33	34	32
A4	77.88	75.71	76.05	75.90	76.72	64.59	76.40	28.00	27.50	.08	.82	23	34	35	33
A5	78.05	75.77	76.31	78.31	78.92	66.65	73.54	18.50	18.50	.08	.61	20	34	33	35
A6	77.24	74.97	75.50	75.47	76.37	63.89	77.12	29.00	29.00	.08	.91	23	34	35	26
Avg.	77.96	75.58	76.17	77.13	77.91	65.46	75.43	23.92	23.75	.07	.90				
Std Dv	.42	.39	.46	1.20	1.12	1.03	1.79	4.32	4.18	.03	.33				
90% CI	.35	.32	.38	.99	.92	.85	1.47	3.55	3.44	.03	.27				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

TABLE A-D-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX NOY BNDS (#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D7	78.99	76.16	75.97	78.16	79.04	66.43	73.73	18.00	18.50	.00	1.03	23	34	33	35
D9	79.33	76.80	77.47	79.46	80.24	67.69	78.29	19.00	19.00	.08	.78	23	34	33	35
Avg.	79.16	76.48	76.72	78.81	79.64	67.06	76.01	18.50	18.75	.04	.90				
Std Dv	.24	.45	1.06	.92	.85	.89	3.22	.71	.35	.06	.18				
90% CI	1.07	2.02	4.72	4.10	3.79	3.98	14.40	3.16	1.58	.25	.79				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D10	77.78	75.25	75.72	76.33	77.26	64.50	73.75	26.50	26.00	.08	1.83	19	32	33	34
D11	78.56	76.17	77.33	76.74	77.41	64.84	76.55	35.50	30.00	.03	.64	23	34	35	33
Avg.	78.17	75.71	76.53	76.54	77.34	64.67	75.15	31.00	28.00	.05	1.24				
Std Dv	.55	.65	1.14	.29	.11	.24	1.98	6.36	2.83	.04	.84				
90% CI	2.46	2.90	5.08	1.29	.47	1.07	8.84	28.41	12.63	.16	3.76				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D12	78.33	75.39	75.65	76.80	77.80	64.77	72.44	24.50	30.50	.09	.91	19	34	26	35
D13	78.92	76.37	77.48	76.35	77.05	64.81	77.81	37.00	37.00	.04	.65	26	34	33	35
Avg.	78.63	75.88	76.57	76.57	77.43	64.79	75.13	30.75	33.75	.06	.78				
Std Dv	.42	.69	1.29	.32	.53	.03	3.80	8.84	4.60	.04	.18				
90% CI	1.86	3.09	5.78	1.42	2.37	.13	16.95	39.46	20.52	.16	.82				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D14	78.95	76.10	76.72	78.37	79.25	65.93	73.53	24.00	22.50	.02	.86	23	34	35	33
D15	79.43	76.88	77.12	76.25	77.11	64.82	78.07	34.00	36.00	.02	.84	23	34	33	35
Avg.	79.19	76.49	76.92	77.31	78.18	65.38	75.80	29.00	29.25	.02	.85				
Std Dv	.34	.55	.28	1.50	1.51	.78	3.21	7.07	9.55	.00	.01				
90% CI	1.52	2.46	1.27	6.69	6.76	3.50	14.33	31.57	42.62	.00	.06				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-E-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER
2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/24/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B15	89.43	87.08	87.94	90.28	91.49	79.19	85.29	15.00	15.00	.00	1.21	20	26	27	25
B16	87.57	84.92	86.57	88.11	90.03	76.26	82.72	21.50	18.00	.00	1.93	20	26	25	27
B17	88.53	85.96	86.23	88.69	90.04	76.57	83.01	18.50	18.00	.02	1.33	20	25	24	26
B18	89.38	87.08	86.46	88.20	89.49	76.57	83.47	19.50	18.50	.02	1.29	20	25	26	27
B19	90.57	88.30	88.68	90.94	92.03	79.39	86.60	17.00	16.50	.01	1.08	20	24	25	26
B20	93.17	91.56	92.07	92.99	94.30	82.41	86.54	18.50	18.50	.02	1.30	20	25	26	28
Avg.	89.78	87.48	87.99	89.87	91.23	78.40	84.61	18.33	17.42	.01	1.36				
Std Dv	1.94	2.30	2.22	1.91	1.79	2.41	1.77	2.21	1.39	.01	.30				
90% CI	1.60	1.89	1.82	1.57	1.47	1.98	1.45	1.81	1.15	.01	.24				
TAKEOFF -- TARGET IAS 40.8 kts															
E1	87.24	83.07	83.73	85.89	87.50	73.12	78.90	23.00	21.50	.02	1.61	20	33	32	35
E2	88.33	84.08	84.12	86.94	88.83	73.81	79.54	21.50	18.50	.01	1.88	20	33	35	32
E3	87.93	83.69	84.51	86.07	87.76	73.21	77.77	27.00	26.00	.00	1.68	20	33	35	32
E5	88.23	83.94	84.72	86.44	88.21	73.50	78.59	26.50	24.50	.01	1.76	20	35	33	32
E6	88.07	83.80	83.75	85.53	87.43	72.69	78.08	25.50	23.00	.01	1.93	20	33	35	32
E7	88.20	83.81	83.59	85.71	87.51	72.80	78.45	24.00	23.00	.01	1.94	20	33	35	32
Avg.	88.00	83.73	84.07	86.10	87.87	73.19	78.56	24.58	22.75	.01	1.80				
Std Dv	.40	.35	.46	.52	.55	.42	.62	2.13	2.58	.01	.14				
90% CI	.33	.29	.38	.43	.45	.35	.51	1.75	2.13	.01	.11				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9 Vh															
A1	83.02	79.08	79.99	83.64	85.83	70.96	78.24	16.00	13.50	.00	2.20	20	35	33	25
A2	84.26	80.52	81.78	83.36	85.60	70.64	78.56	26.00	18.00	.00	2.24	20	35	33	25
A3	83.16	79.45	82.08	83.31	85.74	70.78	78.76	27.00	14.00	.00	2.43	20	32	33	35
A4	84.34	80.44	81.30	83.73	85.94	70.99	78.70	21.50	16.50	.00	2.21	20	35	33	25
A5	82.32	78.95	81.37	82.99	85.13	70.49	78.90	24.50	13.00	.00	2.14	20	25	32	35
A6	84.88	80.91	81.90	83.48	85.53	70.84	79.10	25.50	23.50	.01	2.05	20	35	25	33
Avg.	83.66	79.89	81.40	83.42	85.63	70.78	78.71	23.42	16.42	.00	2.21				
Std Dv	.98	.83	.76	.26	.29	.19	.29	4.09	3.97	.00	.13				
90% CI	.80	.69	.62	.22	.24	.16	.24	3.37	3.26	.00	.10				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department of Transportation
Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-E-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER 2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/24/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D7	83.05	79.11	80.01	84.86	86.81	72.05	78.60	12.50	10.00	.01	1.96	20	35	33	32
D8	84.75	80.67	81.64	84.63	86.72	71.86	78.91	19.00	17.00	.01	2.09	20	33	35	34
Avg.	83.90	79.89	80.82	84.74	86.76	71.96	78.76	15.75	13.50	.01	2.03				
Std Dv	1.20	1.10	1.15	.16	.06	.13	.22	4.60	4.95	.00	.09				
90% CI	5.37	4.92	5.14	.73	.28	.60	.98	20.52	22.10	.00	.41				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D9	82.27	78.91	81.21	82.03	84.10	69.52	78.95	29.50	16.00	.01	2.07	20	25	32	35
D10	84.17	80.21	80.74	82.23	84.44	69.77	78.92	25.00	23.00	.01	2.21	20	25	32	33
Avg.	83.22	79.56	80.97	82.13	84.27	69.64	78.93	27.25	19.50	.01	2.14				
Std Dv	1.34	.92	.33	.14	.24	.18	.02	3.18	4.95	.00	.10				
90% CI	6.00	4.10	1.48	.63	1.07	.79	.09	14.21	22.10	.00	.44				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D11	82.71	78.85	79.49	82.48	84.58	69.95	79.17	18.00	16.00	.01	2.09	20	25	32	35
D12	85.21	81.27	82.16	82.47	84.60	69.86	79.83	34.00	32.00	.01	2.16	20	25	35	33
Avg.	83.96	80.06	80.83	82.48	84.59	69.90	79.50	26.00	24.00	.01	2.13				
Std Dv	1.77	1.71	1.89	.01	.01	.06	.47	11.31	11.31	.00	.05				
90% CI	7.89	7.64	8.44	.03	.06	.28	2.08	50.51	50.51	.00	.22				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D13	83.25	79.50	80.46	82.73	84.88	70.35	79.77	20.50	16.50	.01	2.17	20	25	32	35
D14	85.35	81.34	82.22	81.59	83.64	69.32	80.00	39.00	38.50	.01	2.11	20	25	32	33
Avg.	84.30	80.42	81.34	82.16	84.26	69.83	79.88	29.75	27.50	.01	2.14				
Std Dv	1.48	1.30	1.25	.81	.88	.73	.16	13.08	15.56	.00	.04				
90% CI	6.63	5.81	5.57	3.60	3.91	3.25	.73	58.40	69.45	.00	.19				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-E-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER
2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/24/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
APPROACH -- TARGET IAS 40.8 kts															
B15	84.74	82.75	84.29	83.42	84.63	72.39	78.71	31.00	24.50	.00	1.22	23	23	26	28
B16	83.22	81.31	82.31	80.60	81.36	69.47	77.50	38.50	38.00	.04	.94	26	26	33	32
B17	83.09	80.98	81.86	82.15	83.17	70.98	77.95	24.50	28.00	.04	1.02	28	26	28	23
B18	83.79	81.90	83.21	82.69	83.62	71.31	78.20	31.00	32.00	.04	.93	26	26	23	34
B19	84.75	82.93	84.43	83.94	84.99	73.21	79.41	26.50	29.50	.04	1.04	23	26	23	27
B20	86.38	84.79	85.73	86.34	87.34	75.62	80.16	20.50	22.00	.04	1.00	26	26	27	28
Avg.	84.33	82.44	83.64	83.19	84.18	72.16	78.65	28.67	29.00	.03	1.02				
Std Dv	1.23	1.38	1.45	1.93	2.01	2.12	.99	6.27	5.67	.02	.11				
90% CI	1.01	1.14	1.19	1.59	1.65	1.74	.81	5.15	4.66	.01	.09				
TAKEOFF -- TARGET IAS 40.8 kts															
E1	84.66	81.14	80.78	80.92	82.64	68.41	78.51	34.50	33.00	.04	1.72	23	33	32	23
E2	85.21	81.52	81.75	82.05	84.04	69.71	79.00	32.00	31.50	.04	2.02	23	33	23	32
E3	85.43	81.97	81.79	81.37	83.35	69.18	77.74	36.50	34.50	.04	2.08	23	33	23	32
E5	85.17	81.55	81.37	81.08	83.01	68.82	78.24	36.00	35.00	.07	1.86	23	23	33	32
E6	85.15	81.63	81.70	81.13	83.31	68.97	77.88	37.50	36.50	.03	2.18	23	23	33	32
E7	84.94	81.41	81.88	81.28	83.14	69.04	78.23	38.50	34.50	.03	1.88	23	23	33	34
Avg.	85.09	81.54	81.55	81.31	83.25	69.02	78.27	35.83	34.17	.04	1.96				
Std Dv	.26	.27	.41	.40	.46	.43	.45	2.32	1.72	.01	.17				
90% CI	.22	.22	.34	.33	.38	.35	.37	1.91	1.42	.01	.14				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	82.04	79.31	79.84	80.39	82.00	68.87	77.90	25.00	25.00	.01	1.69	20	33	32	34
A2	82.87	80.12	80.97	80.80	82.54	69.07	75.07	31.00	30.00	.12	1.62	20	32	33	35
A3	81.74	78.82	79.20	80.81	82.18	68.99	78.18	21.00	22.00	.12	1.45	20	33	32	34
A4	83.00	80.53	81.80	81.16	82.66	69.43	75.08	34.50	31.50	.00	1.49	20	33	32	35
A5	81.66	79.06	80.32	80.37	81.61	69.02	78.07	27.00	28.00	.12	1.33	20	33	32	26
A6	83.11	80.52	81.74	81.39	83.18	69.70	75.21	32.00	28.00	.12	1.79	20	32	33	35
Avg.	82.40	79.73	80.65	80.82	82.36	69.18	76.58	28.42	27.42	.08	1.56				
Std Dv	.66	.76	1.05	.41	.55	.32	1.61	5.00	3.44	.06	.17				
90% CI	.55	.62	.86	.33	.45	.26	1.32	4.12	2.83	.05	.14				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-E-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER
2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/24/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D7	82.83	79.97	80.93	82.24	83.52	70.32	78.84	23.00	22.50	.05	1.22	23	33	32	35
D8	84.53	81.79	83.37	82.59	84.21	70.76	75.93	36.50	36.00	.05	1.74	20	33	35	32
Avg.	83.68	80.88	82.15	82.41	83.86	70.54	77.38	29.75	29.25	.05	1.48				
Std Dv	1.20	1.29	1.73	.25	.49	.31	2.06	9.55	9.55	.00	.37				
90% CI	5.37	5.75	7.72	1.10	2.18	1.39	9.19	42.62	42.62	.00	1.64				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D9	81.76	79.00	79.56	79.58	80.99	68.34	77.93	26.50	26.50	.05	1.53	20	32	33	34
D10	82.56	79.64	80.36	79.65	81.35	67.99	75.13	34.50	32.50	.05	1.70	20	32	33	26
Avg.	82.16	79.32	79.96	79.62	81.17	68.16	76.53	30.50	29.50	.05	1.62				
Std Dv	.57	.45	.56	.05	.25	.25	1.98	5.66	4.24	.00	.12				
90% CI	2.53	2.02	2.51	.22	1.14	1.10	8.84	25.26	18.94	.00	.54				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D11	81.40	78.64	78.73	79.27	80.56	67.51	77.86	26.50	26.50	.05	1.28	23	32	33	35
D12	84.05	80.92	83.19	79.67	81.05	68.00	74.91	66.00	78.00	.04	1.34	20	32	35	34
Avg.	82.73	79.78	80.96	79.47	80.81	67.76	76.39	46.25	52.25	.05	1.31				
Std Dv	1.87	1.61	3.15	.28	.35	.35	2.09	27.93	36.42	.01	.04				
90% CI	8.37	7.20	14.06	1.26	1.55	1.55	9.31	124.70	162.59	.03	.19				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D13	81.34	78.53	79.42	79.87	81.20	68.36	78.17	25.50	25.50	.04	1.33	20	33	32	34
D14	84.28	81.21	83.41	79.78	81.70	67.88	75.15	71.50	60.50	.04	2.38	20	32	33	35
Avg.	82.81	79.87	81.41	79.82	81.45	68.12	76.66	48.50	43.00	.04	1.86				
Std Dv	2.08	1.90	2.83	.06	.35	.34	2.14	32.53	24.75	.00	.74				
90% CI	9.28	8.46	12.62	.28	1.58	1.52	9.53	145.22	110.50	.00	3.31				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-E-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER
2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/24/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B15	85.62	83.53	83.52	83.26	84.39	72.14	77.91	27.50	26.50	.01	1.14	23	23	26	28
B16	83.99	81.98	82.84	82.50	83.40	70.67	76.12	33.00	28.50	.01	.89	26	26	24	32
B17	84.47	82.51	82.39	81.87	82.55	71.60	77.45	24.00	30.00	.01	.69	24	24	23	27
B18	84.65	82.83	84.40	82.55	83.82	73.18	77.76	26.50	28.00	.01	1.27	23	27	28	24
B19	85.05	83.31	84.18	82.28	83.67	71.81	78.03	34.50	35.00	.01	1.38	27	23	24	27
B20	85.85	84.12	84.06	83.06	84.01	72.52	78.06	28.50	29.50	.01	.95	26	26	24	23
Avg.	84.94	83.05	83.57	82.59	83.64	71.99	77.56	29.00	29.58	.01	1.05				
Std Dv	.71	.77	.80	.51	.63	.85	.74	4.00	2.92	.00	.26				
90% CI	.58	.63	.66	.42	.52	.70	.61	3.29	2.40	.00	.21				
TAKEOFF -- TARGET IAS 40.8 kts															
E1	85.81	82.38	83.25	83.43	85.16	70.52	74.85	37.50	27.50	.01	1.73	23	35	33	34
E2	86.57	82.92	83.61	84.18	85.82	71.64	75.75	31.50	30.00	.01	1.69	23	35	33	32
E3	86.52	82.93	83.35	82.32	84.02	70.08	74.79	42.50	40.00	.01	1.79	23	23	35	33
E5	86.91	83.19	83.21	83.55	85.41	70.84	75.33	34.50	33.50	.00	1.86	23	35	23	33
E6	86.55	82.95	83.16	83.54	85.28	70.92	74.74	33.50	31.50	.01	1.74	23	35	33	34
E7	86.75	82.93	82.98	83.48	85.17	71.22	75.41	30.00	29.50	.01	1.69	23	35	33	32
Avg.	86.52	82.88	83.26	83.42	85.14	70.87	75.15	34.92	32.00	.01	1.75				
Std Dv	.38	.27	.21	.60	.60	.54	.41	4.52	4.40	.00	.07				
90% CI	.31	.22	.17	.50	.50	.45	.34	3.72	3.62	.00	.05				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A1	81.68	78.91	79.14	81.06	82.96	69.25	75.25	19.50	18.50	.03	1.90	20	33	32	34
A2	83.28	80.46	80.50	80.60	81.99	68.96	77.62	28.50	28.50	.03	1.93	20	33	32	34
A3	81.87	79.01	79.58	80.95	82.19	69.37	75.22	21.00	21.00	.03	1.40	20	33	32	35
A4	83.30	80.42	80.61	81.20	83.18	69.91	78.18	23.50	24.00	.03	2.00	20	33	32	34
A5	81.05	78.50	79.09	80.34	81.91	68.98	74.97	20.50	20.50	.03	1.57	20	32	33	26
A6	83.94	81.02	81.81	82.11	83.31	70.35	77.99	28.00	28.50	.06	1.14	23	33	32	35
Avg.	82.52	79.72	80.12	81.04	82.59	69.47	76.54	23.50	23.50	.04	1.66				
Std Dv	1.14	1.04	1.05	.61	.63	.55	1.54	3.91	4.25	.01	.34				
90% CI	.94	.85	.87	.50	.52	.45	1.27	3.22	3.50	.01	.28				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-E-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER
2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/24/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D7	82.52	79.80	80.37	81.76	83.15	69.96	75.66	22.00	21.50	.06	1.39	23	33	32	34
D8	83.72	80.78	80.79	81.79	82.99	70.18	78.57	23.00	25.50	.11	1.09	23	33	35	32
Avg.	83.12	80.29	80.58	81.78	83.07	70.07	77.12	22.50	23.50	.09	1.24				
Std Dv	.85	.69	.29	.02	.11	.16	2.06	.71	2.83	.04	.21				
90% CI	3.79	3.09	1.30	.09	.51	.69	9.19	3.16	12.63	.16	.95				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D9	80.58	77.71	77.84	79.52	81.07	67.95	75.10	19.50	19.50	.11	1.55	20	33	32	35
D10	83.02	80.10	80.25	80.34	81.58	68.56	77.45	29.50	29.50	.01	1.23	23	32	33	34
Avg.	81.80	78.90	79.04	79.93	81.32	68.25	76.27	24.50	24.50	.06	1.39				
Std Dv	1.73	1.69	1.70	.58	.36	.43	1.66	7.07	7.07	.07	.23				
90% CI	7.70	7.55	7.60	2.59	1.61	1.93	7.42	31.57	31.57	.32	1.01				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D11	81.15	78.27	79.00	79.78	81.07	68.30	74.45	23.50	23.50	.01	1.40	20	32	33	26
D12	83.29	80.41	79.86	79.29	80.97	67.75	77.27	32.50	32.00	.01	1.68	20	35	32	33
Avg.	82.22	79.34	79.43	79.54	81.02	68.03	75.86	28.00	27.75	.01	1.54				
Std Dv	1.51	1.51	.61	.35	.07	.39	1.99	6.36	6.01	.00	.20				
90% CI	6.76	6.76	2.71	1.55	.32	1.74	8.90	28.41	26.83	.00	.88				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D13	81.06	77.99	77.97	78.65	80.70	66.83	75.04	26.00	25.00	.01	2.12	20	33	32	35
D14	83.19	80.44	81.44	79.68	81.20	68.02	77.11	44.00	40.50	.01	1.53	23	32	33	34
Avg.	82.13	79.21	79.71	79.17	80.95	67.43	76.07	35.00	32.75	.01	1.82				
Std Dv	1.51	1.73	2.46	.73	.35	.84	1.46	12.73	10.96	.00	.42				
90% CI	6.72	7.73	10.97	3.25	1.58	3.76	6.53	56.83	48.93	.00	1.86				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED
FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-F-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND RESONATOR
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/25/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B16	91.57	90.01	91.14	90.52	91.84	79.92	85.48	26.50	19.50	.01	1.45	27	27	25	26
B17	92.42	90.61	91.57	92.37	93.53	81.68	86.09	19.50	19.00	.01	1.17	20	25	27	26
B18	92.23	90.51	91.47	93.93	95.09	83.02	87.52	14.00	14.00	.01	1.16	20	25	28	26
B20	92.76	90.91	91.28	93.52	94.73	82.68	86.74	14.50	15.00	.01	1.21	20	25	26	28
B21	90.02	88.01	88.84	89.55	90.64	78.33	84.63	22.50	20.50	.01	1.09	20	26	25	24
B22	91.79	90.13	91.32	92.43	93.41	81.21	86.52	20.50	17.50	.03	.94	20	25	26	28
B23	90.40	88.38	88.88	89.62	91.07	78.47	84.15	22.00	19.50	.03	1.45	20	26	25	28
Avg.	91.60	89.79	90.64	91.71	92.90	80.76	85.88	19.93	17.86	.02	1.21				
Std Dv	1.03	1.14	1.22	1.81	1.75	1.90	1.20	4.46	2.48	.01	.19				
90% CI	.76	.84	.90	1.33	1.29	1.40	.88	3.27	1.82	.01	.14				
TAKEOFF -- TARGET IAS 40.8 kts															
C24	88.11	83.48	84.09	86.14	88.47	73.58	80.33	22.50	22.00	.00	2.35	20	34	35	33
C25	85.93	81.56	82.73	84.29	86.47	72.12	78.39	23.00	22.50	.02	2.16	20	35	34	33
C26	87.22	82.78	83.20	84.57	86.75	72.23	78.83	25.00	24.00	.02	2.19	20	34	35	33
C28	87.83	83.34	84.25	85.81	88.16	73.55	80.75	23.50	20.50	.01	2.34	20	34	35	26
C29	86.79	82.32	82.74	83.75	86.09	71.60	78.64	26.00	24.00	.02	2.31	20	34	35	33
C30	86.81	82.28	83.64	85.54	87.86	73.03	79.56	23.00	22.50	.00	2.32	20	34	35	33
C31	87.10	82.51	83.76	84.95	87.18	72.54	79.24	26.50	27.00	.01	2.22	20	34	35	33
Avg.	87.11	82.61	83.49	85.01	87.28	72.66	79.39	24.21	23.21	.01	2.27				
Std Dv	.72	.66	.61	.87	.90	.75	.88	1.60	2.06	.01	.08				
90% CI	.53	.49	.45	.64	.66	.55	.65	1.18	1.51	.01	.06				
150 m FLYOVER -- TARGET IAS 69 kts -- 0.9Vh															
A1	81.93	78.04	78.83	80.63	82.50	68.22	77.96	23.00	21.50	.00	2.20	20	25	34	33
A2	83.24	79.17	79.97	80.84	82.87	68.51	77.89	28.00	26.50	.00	2.27	20	26	34	25
A3	81.61	77.71	78.58	80.74	82.97	68.69	78.65	19.50	18.00	.00	2.26	20	25	34	35
A4	82.87	78.69	79.23	80.87	82.97	68.53	78.09	23.50	21.00	.01	2.27	20	34	26	35
A6	82.65	78.55	79.56	80.39	82.62	68.26	77.43	27.00	24.50	.01	2.24	20	34	35	25
A7	81.30	77.40	78.27	80.09	82.38	68.06	77.00	21.00	18.50	.01	2.29	20	34	33	25
Avg.	82.27	78.26	79.07	80.59	82.72	68.38	77.84	23.67	21.67	.00	2.25				
Std Dv	.77	.66	.64	.30	.25	.24	.57	3.31	3.33	.01	.03				
90% CI	.63	.54	.52	.25	.21	.19	.47	2.72	2.74	.00	.03				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

TABLE A-F-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND RESONATOR
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/25/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 77.0 kts -- 1.0Vh															
D8	83.14	79.11	80.15	81.14	83.39	68.69	77.61	28.00	25.50	.00	2.25	20	34	35	25
D9	81.96	78.31	79.67	81.37	83.57	69.16	77.97	22.50	17.50	.01	2.39	20	25	34	35
Avg.	82.55	78.71	79.91	81.26	83.48	68.93	77.79	25.25	21.50	.00	2.32				
Std Dv	.83	.57	.34	.16	.13	.33	.25	3.89	5.66	.01	.10				
90% CI	3.73	2.53	1.51	.73	.57	1.48	1.14	17.36	25.26	.03	.44				
150 m FLYOVER -- TARGET IAS 61.6 kts -- 0.8Vh															
D10	83.08	78.97	79.70	80.57	82.31	67.94	78.29	30.00	28.00	.01	1.99	20	25	26	34
D11	81.35	77.52	78.51	80.33	82.46	68.20	78.38	21.50	18.50	.01	2.19	20	25	26	34
Avg.	82.21	78.24	79.11	80.45	82.38	68.07	78.33	25.75	23.25	.01	2.09				
Std Dv	1.22	1.03	.84	.17	.11	.18	.06	6.01	6.72	.00	.14				
90% CI	5.46	4.58	3.75	.76	.47	.82	.28	26.83	29.99	.00	.63				
150 m FLYOVER -- TARGET IAS 53.9 kts -- 0.7Vh															
D12	83.51	79.29	80.33	80.28	82.48	68.29	78.59	32.00	31.50	.01	2.20	20	25	34	26
D13	81.95	78.17	79.65	80.76	82.54	68.51	79.25	26.00	22.00	.01	1.91	20	25	34	26
Avg.	82.73	78.73	79.99	80.52	82.51	68.40	78.92	29.00	26.75	.01	2.06				
Std Dv	1.10	.79	.48	.34	.04	.16	.47	4.24	6.72	.00	.21				
90% CI	4.92	3.54	2.15	1.52	.19	.69	2.08	18.94	29.99	.00	.92				
150 m FLYOVER -- TARGET IAS 46.2 kts -- 0.6Vh															
D14	84.16	79.99	80.52	80.05	82.12	68.15	78.71	34.50	34.50	.01	2.07	20	25	26	34
D15	82.25	78.53	79.56	80.38	82.42	68.50	79.14	25.50	20.50	.01	2.04	20	25	34	33
Avg.	83.21	79.26	80.04	80.21	82.27	68.32	78.93	30.00	27.50	.01	2.05				
Std Dv	1.35	1.03	.68	.23	.21	.25	.30	6.36	9.90	.00	.02				
90% CI	6.03	4.61	3.04	1.04	.95	1.10	1.36	28.41	44.20	.00	.09				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED
FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-F-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND RESONATOR
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/25/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
APPROACH -- TARGET IAS 40.8 kts															
B16	85.70	83.86	85.01	84.27	85.66	73.47	79.55	28.50	28.50	.06	1.33	27	24	27	23
B17	87.56	85.93	88.87	86.49	87.99	76.38	80.21	35.50	20.50	.06	1.51	27	27	26	28
B18	86.29	84.59	85.76	85.59	86.81	74.88	79.50	24.50	22.50	.01	1.21	22	26	27	28
B20	87.21	85.59	86.72	85.94	87.02	75.75	79.90	25.00	25.00	.01	1.17	22	26	27	28
B21	86.07	84.42	85.58	84.12	85.46	74.28	78.87	27.00	27.50	.02	1.32	27	27	28	29
B22	85.72	84.07	85.49	85.58	87.05	75.71	78.66	19.00	19.50	.02	1.47	27	27	28	26
B23	84.75	82.88	83.95	82.75	83.91	71.84	78.33	32.50	31.50	.02	1.17	22	23	26	28
Avg.	86.19	84.48	85.91	84.96	86.27	74.62	79.29	27.43	25.00	.03	1.31				
Std Dv	.96	1.04	1.55	1.30	1.36	1.57	.69	5.44	4.43	.02	.14				
90% CI	.70	.76	1.14	.96	1.00	1.15	.50	4.00	3.25	.02	.10				
TAKEOFF -- TARGET IAS 40.8 kts															
C24	84.81	81.04	82.44	82.69	84.83	70.54	79.56	31.00	31.00	.00	2.14	23	23	33	34
C25	84.66	80.47	81.41	82.48	85.17	70.44	78.98	25.00	23.50	.02	2.68	23	23	33	34
C26	84.72	81.10	81.77	82.51	84.81	70.16	79.10	29.00	23.50	.02	2.30	23	23	34	33
C28	84.98	81.67	82.35	82.51	84.65	71.29	79.74	25.50	23.50	.02	2.13	23	23	33	34
C29	84.59	81.19	82.28	81.20	83.26	70.04	78.46	33.50	34.00	.02	2.06	23	23	33	34
C30	84.53	81.02	81.34	81.38	83.94	70.20	78.91	26.00	26.00	.02	2.63	23	23	33	34
C31	84.33	80.50	81.71	81.73	83.87	69.54	78.52	33.00	32.50	.02	2.12	23	23	33	34
Avg.	84.66	81.00	81.90	82.07	84.36	70.32	79.04	29.00	27.71	.02	2.29				
Std Dv	.21	.41	.46	.62	.68	.54	.48	3.59	4.64	.01	.26				
90% CI	.15	.30	.33	.45	.50	.39	.35	2.64	3.41	.01	.19				
150 m FLYOVER -- TARGET IAS 69.3 kts -- 0.9Vh															
A1	81.31	78.95	78.74	78.30	79.82	67.28	77.27	28.00	28.00	.05	1.47	23	24	32	25
A2	82.70	79.68	79.64	79.57	81.55	67.15	76.04	35.50	28.00	.05	1.99	23	23	34	33
A3	80.95	78.48	78.83	78.41	79.88	68.04	77.97	24.00	26.00	.05	1.57	23	33	32	34
A4	82.39	79.38	79.27	79.88	82.04	67.51	75.88	30.00	26.50	.05	2.16	23	23	34	33
A6	82.63	79.55	79.42	79.78	81.95	67.25	75.65	33.00	28.50	.05	2.17	23	23	34	33
A7	80.35	78.20	78.73	78.08	79.46	68.03	76.78	23.50	25.50	.00	1.39	20	34	33	26
Avg.	81.72	79.04	79.11	79.00	80.78	67.54	76.60	29.00	27.08	.04	1.79				
Std Dv	.99	.60	.39	.82	1.19	.40	.90	4.81	1.24	.02	.36				
90% CI	.81	.50	.32	.68	.97	.33	.74	3.95	1.02	.02	.29				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

TABLE A-F-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND RESONATOR
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/25/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 77.0 kts 1.0Vh															
D8	82.89	80.02	80.49	80.51	82.47	69.03	75.67	28.00	25.00	.04	1.92	23	23	33	34
D9	81.66	79.37	79.42	79.71	81.26	69.42	77.99	20.00	22.00	.04	1.56	23	24	32	27
Avg.	82.28	79.69	79.96	80.11	81.87	69.22	76.83	24.00	23.50	.04	1.74				
Std Dv	.87	.46	.76	.57	.86	.28	1.64	5.66	2.12	.00	.25				
90% CI	3.88	2.05	3.38	2.53	3.82	1.23	7.32	25.26	9.47	.00	1.14				
150 m FLYOVER -- TARGET IAS 61.6 kts -- 0.8Vh															
D10	82.34	79.25	79.31	78.71	80.78	66.64	75.11	37.00	32.00	.05	2.03	23	23	34	33
D11	79.88	77.46	77.81	77.75	78.96	67.30	77.13	22.50	25.00	.05	1.45	23	34	33	32
Avg.	81.11	78.35	78.56	78.23	79.87	66.97	76.12	29.75	28.50	.05	1.74				
Std Dv	1.74	1.27	1.06	.68	1.29	.47	1.43	10.25	4.95	.00	.41				
90% CI	7.77	5.65	4.74	3.03	5.75	2.08	6.38	45.78	22.10	.00	1.83				
150 m FLYOVER -- TARGET IAS 53.9 kts -- 0.7Vh															
D12	82.40	79.53	80.46	78.43	80.64	66.23	75.28	53.00	37.50	.05	2.21	23	23	34	33
D13	80.07	77.68	77.84	77.37	78.46	66.96	77.15	24.50	26.50	.00	1.61	23	33	34	23
Avg.	81.24	78.60	79.15	77.90	79.55	66.60	76.21	38.75	32.00	.03	1.91				
Std Dv	1.65	1.31	1.85	.75	1.54	.52	1.32	20.15	7.78	.04	.42				
90% CI	7.36	5.84	8.27	3.35	6.88	2.30	5.90	89.97	34.73	.16	1.89				
150 m FLYOVER -- TARGET IAS 46.2 kts -- 0.6Vh															
D14	82.61	79.29	80.32	77.59	79.89	65.62	74.93	59.00	46.00	.00	2.29	23	23	34	33
D15	80.38	77.97	78.16	77.36	79.28	66.78	77.04	27.50	25.00	.05	1.97	23	34	33	32
Avg.	81.49	78.63	79.24	77.47	79.58	66.20	75.99	43.25	35.50	.03	2.13				
Std Dv	1.58	.93	1.52	.16	.43	.82	1.49	22.27	14.85	.04	.23				
90% CI	7.04	4.17	6.80	.73	1.93	3.66	6.66	99.45	66.30	.16	1.01				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-F-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND RESONATOR
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/25/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 40.8 kts															
B16	86.64	84.67	84.50	83.59	85.09	72.33	78.68	33.00	32.50	.05	1.50	27	24	27	23
B17	86.17	83.92	84.02	83.83	84.78	72.33	78.83	29.50	29.00	.01	.94	26	23	26	24
B18	85.73	83.55	83.86	83.54	84.50	71.69	78.69	33.00	31.00	.05	1.09	18	23	24	26
B20	86.21	83.57	83.41	82.77	84.28	71.30	77.72	32.50	39.00	.05	1.72	27	24	23	27
B21	85.29	82.93	83.39	82.87	83.68	71.49	77.35	31.00	31.00	.01	.80	26	23	26	28
B22	84.76	82.62	83.52	82.20	83.14	70.68	77.19	38.50	36.50	.00	.93	26	23	26	24
B23	85.94	83.94	84.31	82.58	83.73	72.55	77.81	30.00	34.50	.00	1.43	23	28	33	32
Avg.	85.82	83.60	83.86	83.05	84.17	71.77	78.04	32.50	33.36	.02	1.20				
Std Dv	.63	.68	.44	.60	.69	.67	.68	3.00	3.51	.02	.35				
90% CI	.46	.50	.33	.44	.50	.50	.50	2.20	2.58	.02	.26				
TAKEOFF -- TARGET IAS 40.8 kts															
C24	86.13	82.12	82.59	82.60	84.87	70.83	76.14	30.00	30.50	.00	2.27	23	33	34	32
C25	85.42	81.47	82.01	82.00	84.59	70.18	75.67	30.50	29.00	.00	2.59	23	33	32	34
C26	86.22	82.41	83.55	82.34	84.48	70.59	75.85	39.50	38.00	.00	2.39	23	34	33	32
C28	86.20	82.77	83.39	82.76	84.79	71.28	76.13	32.50	31.50	.00	2.09	23	34	33	35
C29	86.24	82.58	82.66	82.79	85.23	70.69	76.69	31.50	30.00	.00	2.47	23	33	32	34
C30	86.05	82.45	82.13	81.89	84.52	70.16	76.24	31.50	30.50	.00	2.63	23	33	34	32
C31	85.34	81.56	81.72	80.99	83.31	69.35	75.25	34.50	33.50	.06	2.26	20	33	32	34
Avg.	85.94	82.19	82.58	82.20	84.54	70.44	76.00	32.86	31.86	.01	2.39				
Std Dv	.39	.50	.69	.64	.60	.62	.46	3.28	3.05	.02	.19				
90% CI	.29	.37	.51	.47	.44	.45	.34	2.41	2.24	.02	.14				
150 m FLYOVER -- TARGET IAS 69 kts -- 0.9Vh															
A1	81.88	79.06	79.27	79.34	81.13	68.21	75.49	25.50	25.50	.02	1.79	19	24	23	34
A2	82.73	80.14	80.48	79.21	80.94	68.18	77.37	34.00	33.00	.02	1.73	23	34	33	32
A3	81.14	78.44	79.05	79.56	81.10	68.54	74.82	22.50	23.00	.02	1.54	23	34	33	35
A4	82.54	79.94	80.22	79.28	80.73	68.18	77.50	32.00	31.50	.02	1.45	23	34	33	35
A6	82.64	80.06	80.56	78.99	80.53	68.52	77.49	32.00	32.50	.02	1.56	23	34	33	32
A7	82.57	79.83	80.35	79.97	81.61	69.38	75.64	25.00	26.50	.02	1.96	23	24	23	34
Avg.	82.25	79.58	79.99	79.39	81.01	68.50	76.39	28.50	28.67	.02	1.67				
Std Dv	.62	.68	.66	.34	.37	.46	1.20	4.73	4.20	.00	.19				
90% CI	.51	.56	.54	.28	.31	.38	.99	3.89	3.46	.00	.16				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-F-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND RESONATOR
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/25/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 77.0 kts -- 1.0Vh															
D8	83.11	80.69	81.09	80.42	82.07	69.71	78.13	27.50	28.50	.02	1.65	20	34	33	32
D9	82.43	79.71	79.71	80.94	82.61	69.40	75.51	21.50	21.50	.02	1.67	23	24	34	33
Avg.	82.77	80.20	80.40	80.68	82.34	69.56	76.82	24.50	25.00	.02	1.66				
Std Dv	.48	.69	.98	.37	.38	.22	1.85	4.24	4.95	.00	.01				
90% CI	2.15	3.09	4.35	1.64	1.70	.98	8.27	18.94	22.10	.00	.06				
150 m FLYOVER -- TARGET IAS 61.6 kts -- 0.8Vh															
D10	82.09	79.37	79.47	78.31	79.84	67.57	77.18	31.00	33.50	.02	1.53	23	34	33	32
D11	80.72	77.83	78.21	78.25	79.76	67.60	73.74	23.00	25.50	.05	1.46	23	34	33	32
Avg.	81.40	78.60	78.84	78.28	79.80	67.58	75.46	27.00	29.50	.04	1.50				
Std Dv	.97	1.09	.90	.04	.06	.02	2.43	5.66	5.66	.02	.05				
90% CI	4.33	4.86	4.00	.19	.25	.09	10.86	25.26	25.26	.09	.22				
150 m FLYOVER -- TARGET IAS 53.9 kts -- 0.7Vh															
D12	82.49	79.78	80.70	78.48	80.19	67.38	77.04	43.00	43.50	.00	1.71	23	34	33	32
D13	81.26	78.50	79.29	78.54	79.91	67.75	73.90	28.50	29.50	.00	1.53	23	34	33	35
Avg.	81.88	79.14	80.00	78.51	80.05	67.57	75.47	35.75	36.50	.00	1.62				
Std Dv	.87	.91	1.00	.04	.20	.26	2.22	10.25	9.90	.00	.13				
90% CI	3.88	4.04	4.47	.19	.88	1.17	9.91	45.78	44.20	.00	.57				
150 m FLYOVER -- TARGET IAS 46.2 kts -- 0.6Vh															
D14	82.83	79.85	81.01	78.32	80.42	67.30	76.80	47.00	49.00	.00	2.10	23	34	33	32
D15	80.89	77.82	78.68	77.65	79.36	66.78	73.77	31.00	31.50	.00	1.93	20	34	33	32
Avg.	81.86	78.83	79.85	77.99	79.89	67.04	75.29	39.00	40.25	.00	2.01				
Std Dv	1.37	1.44	1.65	.47	.75	.37	2.14	11.31	12.37	.00	.12				
90% CI	6.12	6.41	7.35	2.12	3.35	1.64	9.57	50.51	55.25	.00	.54				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-G-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/25/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
APPROACH -- TARGET IAS 40.8 kts															
B16	91.11	88.96	89.05	91.15	92.24	80.30	85.79	15.00	16.00	.01	1.19	20	25	27	26
B17	91.61	89.84	90.08	91.18	92.41	80.66	86.29	17.50	15.50	.01	1.27	27	25	27	26
B19	91.98	90.14	90.94	92.86	93.78	81.78	87.14	16.50	17.00	.20	.92	20	25	26	28
B20	89.72	87.39	88.03	89.19	89.95	79.14	83.44	15.50	19.50	.07	.69	23	26	28	27
B21	90.92	89.06	90.31	89.16	90.08	78.93	84.73	27.50	27.00	.07	1.05	27	27	25	26
B24	92.09	90.41	90.57	92.90	94.13	81.97	87.63	14.50	14.00	.07	1.22	20	24	25	26
Avg.	91.24	89.30	89.83	91.07	92.10	80.46	85.84	17.75	18.17	.07	1.06				
Std Dv	.88	1.10	1.09	1.66	1.78	1.28	1.56	4.90	4.70	.07	.22				
90% CI	.72	.90	.90	1.36	1.46	1.05	1.28	4.03	3.86	.06	.18				
TAKEOFF -- TARGET IAS 40.8 kts															
C25	87.93	83.91	84.52	86.31	88.50	74.31	81.47	21.00	20.50	.00	2.19	20	25	32	34
C26	86.13	82.24	82.75	83.49	85.76	71.69	79.48	25.50	22.00	.00	2.27	20	25	33	32
C27	87.77	83.92	84.68	83.96	86.24	72.07	80.37	36.50	35.00	.00	2.67	20	25	34	32
C28	87.31	83.54	84.09	84.57	86.54	72.48	80.21	29.00	28.00	.00	2.07	20	25	33	32
C29	86.75	83.07	84.26	83.94	86.02	72.15	79.26	32.50	32.00	.00	2.08	20	25	33	32
C30	87.39	83.60	84.69	85.55	87.61	73.47	81.04	26.50	23.50	.00	2.06	20	25	34	33
Avg.	87.21	83.38	84.17	84.64	86.78	72.69	80.31	28.50	26.83	.00	2.22				
Std Dv	.67	.64	.74	1.09	1.06	1.00	.86	5.47	5.82	.00	.23				
90% CI	.55	.53	.60	.89	.87	.82	.71	4.50	4.79	.00	.19				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A2	84.11	80.25	81.51	82.79	84.85	70.37	79.80	26.00	21.00	.00	2.07	20	25	26	34
A3	83.79	80.13	82.15	83.48	85.54	71.09	79.84	25.50	18.50	.00	2.06	20	25	33	34
A4	84.02	80.21	81.39	83.20	85.32	70.69	79.70	23.50	17.00	.00	2.13	20	25	26	34
A5	83.81	79.88	80.64	83.52	85.56	70.64	79.74	20.00	16.50	.00	2.04	20	25	34	35
A6	83.90	80.33	82.19	82.46	84.39	69.95	79.02	33.50	19.00	.00	2.19	20	25	34	26
A7	83.67	80.12	82.71	82.91	84.98	70.54	79.27	33.00	25.50	.00	2.08	20	25	34	33
Avg.	83.88	80.15	81.76	83.06	85.11	70.55	79.56	26.92	19.58	.00	2.10				
Std Dv	.16	.16	.73	.42	.45	.38	.34	5.34	3.31	.00	.06				
90% CI	.13	.13	.60	.34	.37	.31	.28	4.39	2.72	.00	.05				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department of Transportation
Volpe Center Acoustics Facility

February 16, 1993

TABLE A-G-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/25/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D8	83.81	79.96	81.73	83.13	85.03	70.76	79.57	25.00	23.50	.00	2.01	20	25	34	33
D9	83.38	79.54	81.53	82.75	84.86	70.65	78.82	24.50	22.00	.00	2.15	20	25	34	33
Avg.	83.60	79.75	81.63	82.94	84.94	70.71	79.19	24.75	22.75	.00	2.08				
Std Dv	.30	.30	.14	.27	.12	.08	.53	.35	1.06	.00	.10				
90% CI	1.36	1.33	.62	1.20	.54	.35	2.37	1.58	4.74	.00	.44				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D10	83.37	79.89	82.47	82.03	84.07	69.68	78.93	38.00	21.50	.00	2.04	20	25	34	26
D11	84.02	80.38	83.04	82.21	84.17	70.14	80.47	39.00	33.00	.02	1.95	20	25	26	34
Avg.	83.69	80.13	82.75	82.12	84.12	69.91	79.70	38.50	27.25	.01	2.00				
Std Dv	.46	.35	.41	.13	.07	.33	1.09	.71	8.13	.01	.06				
90% CI	2.05	1.55	1.81	.57	.32	1.45	4.86	3.16	36.31	.06	.28				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D12	84.81	81.09	82.45	82.65	84.67	70.62	81.47	30.50	22.00	.01	2.01	20	26	25	34
D13	83.21	79.37	81.12	81.69	83.71	69.22	79.89	31.00	22.00	.01	2.17	20	25	26	34
Avg.	84.01	80.23	81.79	82.17	84.19	69.92	80.68	30.75	22.00	.01	2.09				
Std Dv	1.13	1.22	.94	.68	.68	.99	1.12	.35	.00	.00	.11				
90% CI	5.05	5.43	4.20	3.03	3.03	4.42	4.99	1.58	.00	.00	.51				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D14	84.76	80.76	81.64	81.91	83.92	69.74	80.39	31.00	28.00	.01	2.04	20	25	26	34
D15	84.22	80.26	81.53	82.14	84.19	70.31	80.70	26.50	25.50	.01	2.07	20	25	26	34
Avg.	84.49	80.51	81.59	82.03	84.06	70.02	80.54	28.75	26.75	.01	2.05				
Std Dv	.38	.35	.08	.16	.19	.40	.22	3.18	1.77	.00	.02				
90% CI	1.70	1.58	.35	.73	.85	1.80	.98	14.21	7.89	.00	.09				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-G-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/25/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
APPROACH -- TARGET IAS 40.8 kts															
B16	84.59	82.55	84.19	83.31	84.37	72.22	78.70	31.50	30.50	.04	1.02	23	23	26	28
B17	85.86	84.27	85.90	86.50	87.83	76.36	79.56	18.00	19.50	.04	1.33	27	27	26	28
B19	84.82	82.98	84.62	84.08	85.05	73.40	79.42	26.50	26.50	.00	.97	23	26	23	28
B20	85.48	83.72	85.67	85.08	86.82	75.06	77.97	23.00	24.50	.00	1.73	27	27	29	28
B21	84.67	83.24	84.27	82.77	83.66	72.73	78.53	28.50	30.50	.00	.89	23	26	28	27
B24	86.36	84.80	84.67	84.61	85.63	74.67	79.63	20.00	22.00	.00	1.12	23	24	27	23
Avg.	85.30	83.59	84.89	84.39	85.56	74.07	78.97	24.58	25.58	.01	1.18				
Std Dv	.72	.84	.72	1.33	1.55	1.57	.67	5.17	4.48	.02	.31				
90% CI	.59	.69	.60	1.10	1.28	1.29	.55	4.25	3.68	.02	.26				
TAKEOFF -- TARGET IAS 40.8 kts															
C25	84.65	81.40	81.61	81.80	83.68	70.31	79.06	27.00	26.00	.00	1.88	23	23	34	33
C26	84.16	80.78	81.89	81.31	83.60	69.59	78.66	34.00	31.00	.00	2.41	23	23	33	34
C27	84.37	81.40	82.82	82.45	84.57	70.33	79.31	35.50	22.00	.00	2.12	23	23	33	34
C28	84.05	80.47	80.72	81.09	83.12	69.66	78.99	25.50	25.00	.00	2.03	23	23	33	34
C29	83.39	79.79	80.80	80.26	82.67	68.13	77.76	37.00	27.50	.00	2.49	23	23	33	26
C30	83.83	80.52	81.26	81.15	83.04	69.29	79.01	31.50	30.50	.00	1.89	23	23	33	32
Avg.	84.08	80.73	81.57	81.34	83.45	69.55	78.80	31.75	27.00	.00	2.14				
Std Dv	.44	.62	.78	.74	.67	.81	.55	4.66	3.42	.00	.26				
90% CI	.36	.51	.65	.61	.55	.67	.45	3.83	2.81	.00	.21				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A2	82.59	79.67	79.89	80.04	82.11	68.75	75.87	26.00	22.50	.00	2.07	23	23	33	32
A3	81.62	79.13	80.04	81.26	82.48	70.75	78.15	17.00	20.00	.00	1.22	23	33	26	34
A4	82.71	79.77	80.36	80.04	82.22	68.53	75.55	30.50	29.50	.00	2.18	23	23	33	32
A5	81.80	79.22	79.80	79.43	80.56	69.29	77.55	22.50	26.50	.01	1.12	23	32	33	34
A6	82.68	79.61	80.38	80.60	82.69	69.16	75.56	26.50	22.50	.01	2.07	23	23	33	32
A7	81.73	78.94	79.54	79.78	81.18	69.03	78.22	22.50	23.50	.01	1.39	23	26	34	33
Avg.	82.19	79.39	80.00	80.19	81.87	69.25	76.82	24.17	24.08	.00	1.68				
Std Dv	.52	.34	.33	.65	.83	.78	1.29	4.60	3.38	.01	.48				
90% CI	.43	.28	.27	.53	.68	.65	1.06	3.78	2.78	.00	.40				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

TABLE A-G-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/25/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D8	83.55	80.52	80.86	82.46	83.86	71.20	76.64	18.50	19.00	.07	1.32	23	34	33	35
D9	81.85	79.36	80.49	79.62	80.91	68.95	78.19	28.50	28.00	.04	1.25	23	26	34	32
Avg.	82.70	79.94	80.67	81.04	82.39	70.07	77.42	23.50	23.50	.05	1.29				
Std Dv	1.20	.82	.26	2.01	2.09	1.59	1.10	7.07	6.36	.02	.05				
90% CI	5.37	3.66	1.18	8.97	9.31	7.10	4.89	31.57	28.41	.09	.22				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D10	82.40	79.23	79.58	80.28	82.63	68.12	76.50	28.00	24.50	.04	2.36	23	23	24	33
D11	82.09	79.37	79.52	78.73	80.42	67.76	78.51	30.00	29.50	.04	1.72	23	33	34	32
Avg.	82.24	79.30	79.55	79.51	81.52	67.94	77.51	29.00	27.00	.04	2.04				
Std Dv	.22	.10	.04	1.10	1.56	.25	1.42	1.41	3.54	.00	.45				
90% CI	.98	.44	.19	4.89	6.98	1.14	6.35	6.31	15.78	.00	2.02				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D12	82.84	79.84	80.44	80.14	81.91	68.14	76.20	34.00	29.50	.04	1.77	23	23	32	33
D13	81.30	78.65	79.96	78.71	80.07	68.06	78.15	31.00	31.00	.04	1.51	23	33	26	34
Avg.	82.07	79.24	80.20	79.43	80.99	68.10	77.18	32.50	30.25	.04	1.64				
Std Dv	1.09	.84	.34	1.01	1.30	.06	1.38	2.12	1.06	.00	.18				
90% CI	4.86	3.76	1.52	4.51	5.81	.25	6.16	9.47	4.74	.00	.82				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D14	82.76	79.40	79.59	79.11	81.27	66.47	75.79	41.00	36.50	.09	2.07	23	23	34	33
D15	81.40	78.58	79.95	79.57	81.24	68.41	78.57	28.50	28.50	.09	1.67	23	34	33	32
Avg.	82.08	78.99	79.77	79.34	81.25	67.44	77.18	34.75	32.50	.09	1.87				
Std Dv	.96	.58	.25	.33	.02	1.37	1.97	8.84	5.66	.00	.28				
90% CI	4.29	2.59	1.14	1.45	.09	6.12	8.78	39.46	25.26	.00	1.26				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-G-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND DIRECTED EXHAUST
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/25/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
APPROACH -- TARGET IAS 40.8 kts															
B16	84.85	82.35	83.36	83.37	84.53	71.60	78.01	30.00	30.00	.03	1.53	27	23	24	27
B17	84.59	82.38	82.66	82.06	83.00	70.83	77.28	30.50	30.00	.03	.93	23	23	24	26
B19	85.52	83.79	84.51	82.04	83.49	71.67	77.47	38.50	38.00	.03	1.45	27	23	24	27
B20	84.00	81.88	83.44	81.72	82.67	70.60	76.48	38.50	38.00	.00	.95	23	23	24	27
B21	85.33	83.58	83.49	82.11	83.93	71.19	77.56	34.00	32.00	.00	1.82	27	24	23	27
B24	85.55	83.21	84.49	83.47	84.57	71.88	78.29	36.50	39.50	.03	2.00	27	23	27	24
Avg.	84.97	82.86	83.66	82.46	83.70	71.29	77.52	34.67	34.58	.02	1.45				
Std Dv	.61	.77	.72	.76	.79	.51	.63	3.80	4.39	.02	.44				
90% CI	.50	.63	.59	.62	.65	.42	.52	3.13	3.61	.01	.36				
TAKEOFF -- TARGET IAS 40.8 kts															
C25	85.59	82.33	83.00	83.28	85.20	71.46	76.57	28.50	27.50	.04	1.88	23	33	34	32
C26	85.17	81.73	81.88	81.89	83.76	70.42	75.51	28.00	30.50	.04	1.87	23	33	34	32
C27	85.66	82.27	83.46	82.84	85.17	70.97	75.58	35.50	32.00	.00	2.33	23	33	34	32
C28	85.18	81.81	83.03	83.34	85.25	71.65	76.21	27.50	27.00	.04	1.91	20	33	32	34
C29	85.16	81.75	82.48	80.69	82.79	69.26	74.48	42.00	41.50	.04	2.10	23	33	32	34
C30	85.45	82.03	82.49	81.52	82.80	70.25	75.45	33.50	37.00	.02	1.36	23	33	32	34
Avg.	85.37	81.99	82.72	82.26	84.16	70.67	75.63	32.50	32.58	.03	1.91				
Std Dv	.23	.27	.55	1.07	1.20	.88	.72	5.68	5.67	.02	.32				
90% CI	.19	.22	.46	.88	.99	.73	.59	4.68	4.66	.01	.26				
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh															
A2	82.30	80.12	80.51	80.55	82.05	70.10	78.27	22.00	23.50	.00	1.51	26	26	33	34
A3	82.35	79.83	80.38	81.03	83.02	69.59	75.69	24.00	19.00	.00	1.99	23	25	34	32
A4	82.33	80.07	80.72	79.79	81.24	69.50	77.86	26.50	31.00	.00	1.49	26	26	33	34
A5	82.67	79.76	80.34	80.70	82.08	70.03	75.98	21.50	28.50	.04	1.33	23	34	33	32
A6	82.47	80.14	80.62	79.77	81.16	69.48	77.86	26.00	27.00	.04	2.00	23	32	27	23
A7	82.24	79.35	79.56	80.19	82.03	69.45	76.02	20.50	21.50	.04	1.90	23	23	34	32
Avg.	82.39	79.88	80.36	80.34	81.93	69.69	76.95	23.42	25.08	.02	1.70				
Std Dv	.16	.30	.42	.51	.68	.29	1.17	2.48	4.53	.02	.29				
90% CI	.13	.25	.34	.42	.56	.24	.96	2.04	3.73	.02	.24				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-G-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND DIRECTED EXHAUST
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/25/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh															
D8	82.78	80.48	81.84	81.90	83.48	71.63	79.30	21.00	22.00	.04	1.58	26	26	34	33
D9	82.87	80.18	80.40	81.39	83.13	70.40	76.16	20.00	20.00	.04	1.73	23	33	34	32
Avg.	82.82	80.33	81.12	81.65	83.31	71.01	77.73	20.50	21.00	.04	1.65				
Std Dv	.06	.21	1.02	.36	.25	.87	2.22	.71	1.41	.00	.11				
90% CI	.28	.95	4.55	1.61	1.10	3.88	9.91	3.16	6.31	.00	.47				
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh															
D10	81.99	79.68	80.60	78.87	80.25	68.77	77.57	30.50	34.50	.04	1.38	23	34	26	33
D11	82.34	79.27	80.16	79.83	81.66	68.70	75.57	28.00	28.50	.09	1.73	23	23	33	34
Avg.	82.16	79.47	80.38	79.35	80.96	68.74	76.57	29.25	31.50	.06	1.56				
Std Dv	.25	.29	.31	.68	1.00	.05	1.41	1.77	4.24	.04	.25				
90% CI	1.10	1.29	1.39	3.03	4.45	.22	6.31	7.89	18.94	.16	1.10				
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh															
D12	82.55	79.94	81.59	80.04	81.66	68.98	79.13	36.50	39.00	.03	1.59	23	34	26	33
D13	81.88	78.92	80.24	78.37	80.65	67.69	74.93	36.00	35.00	.03	2.53	23	25	34	32
Avg.	82.21	79.43	80.92	79.21	81.15	68.34	77.03	36.25	37.00	.03	2.06				
Std Dv	.47	.72	.95	1.18	.71	.91	2.97	.35	2.83	.00	.66				
90% CI	2.12	3.22	4.26	5.27	3.19	4.07	13.26	1.58	12.63	.00	2.97				
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh															
D14	82.38	79.86	80.86	78.31	80.15	67.39	78.06	44.50	44.00	.03	1.84	23	34	32	33
D15	82.05	78.89	80.21	78.11	80.45	67.42	75.06	38.00	31.50	.03	2.53	23	23	33	34
Avg.	82.21	79.38	80.54	78.21	80.30	67.40	76.56	41.25	37.75	.03	2.18				
Std Dv	.23	.69	.46	.14	.21	.02	2.12	4.60	8.84	.00	.49				
90% CI	1.04	3.06	2.07	.63	.95	.09	9.47	20.52	39.46	.00	2.18				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED
FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-H-1-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 50.0 kts															
B17	91.86	89.76	90.07	94.39	95.76	84.05	88.34	8.00	9.00	.10	1.37	20	25	28	26
B18	89.25	86.10	86.77	89.60	91.27	78.32	83.96	14.00	14.00	.10	1.71	20	27	25	23
B19	92.37	90.16	90.10	93.83	94.67	82.32	88.78	12.00	11.50	.10	.96	20	26	27	22
B20	93.02	91.04	91.24	93.73	94.98	82.64	87.98	14.50	13.50	.10	1.25	20	26	27	25
B21	93.19	91.41	92.97	94.14	95.39	83.68	87.89	17.00	17.00	.03	1.22	20	28	25	27
B22	93.75	91.98	92.76	95.03	96.00	84.47	89.00	13.50	13.50	.02	.96	20	26	27	25
Avg.	92.24	90.08	90.65	93.45	94.68	82.58	87.66	13.17	13.08	.08	1.25				
Std Dv	1.61	2.11	2.28	1.94	1.74	2.24	1.86	3.01	2.67	.04	.28				
90% CI	1.32	1.74	1.87	1.60	1.43	1.85	1.53	2.48	2.20	.03	.23				
TAKEOFF -- TARGET IAS 50.0 kts															
C29	84.28	80.40	81.67	84.59	86.48	71.56	81.11	20.50	14.00	.02	1.88	20	25	26	34
C30	83.59	79.73	80.92	81.87	83.77	69.09	78.71	30.50	24.50	.02	1.89	20	25	26	34
C31	83.83	80.09	80.94	82.38	84.43	69.80	78.64	26.00	20.00	.02	2.06	20	25	26	34
C32	84.34	80.43	81.40	83.09	85.11	70.34	79.48	25.50	21.00	.02	2.64	20	25	26	34
C33	84.75	81.38	83.12	83.64	85.54	70.75	79.59	34.50	18.50	.06	1.84	20	25	26	34
C34	85.34	81.31	82.13	84.52	86.59	71.82	79.83	21.50	19.00	.06	2.06	20	25	26	34
Avg.	84.35	80.56	81.70	83.35	85.32	70.56	79.56	26.42	19.50	.03	2.06				
Std Dv	.63	.66	.83	1.11	1.12	1.04	.90	5.33	3.44	.02	.30				
90% CI	.52	.54	.69	.92	.92	.86	.74	4.39	2.83	.02	.25				
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh															
A1	83.68	79.62	80.46	84.20	86.08	71.17	79.32	17.00	13.50	.00	1.88	20	25	26	34
A2	84.62	80.44	81.68	84.59	86.86	71.47	79.36	21.00	15.50	.00	2.56	20	25	34	26
A3	82.88	78.72	79.48	84.51	86.24	71.52	79.14	12.50	11.50	.00	1.73	20	25	26	34
A5	84.11	80.10	81.40	84.47	86.53	71.40	79.50	20.00	14.00	.00	2.06	20	25	26	34
A6	83.05	78.57	79.59	84.87	86.74	71.63	79.63	12.50	10.50	.05	1.82	20	25	26	34
A7	83.65	79.43	80.48	84.00	85.77	70.82	79.30	18.50	15.50	.05	1.78	20	25	26	34
Avg.	83.66	79.48	80.52	84.44	86.37	71.33	79.38	16.92	13.42	.02	1.97				
Std Dv	.65	.74	.90	.30	.42	.30	.17	3.68	2.06	.03	.31				
90% CI	.53	.61	.74	.25	.34	.24	.14	3.03	1.69	.02	.26				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-H-1-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	----	------	------	------	------	-----	------	-----	------	------	-----	-----	-----	-----	-----
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh															
D8	84.50	80.29	81.29	86.01	88.16	73.00	83.07	13.50	11.50	.07	2.15	20	25	26	34
D9	86.11	82.08	83.49	86.83	88.66	73.83	83.25	18.50	16.00	.10	1.73	20	25	34	35
Avg.	85.31	81.18	82.39	86.42	88.41	73.42	83.16	16.00	13.75	.09	1.94				
Std Dv	1.14	1.27	1.55	.58	.35	.59	.13	3.54	3.18	.02	.30				
90% CI	5.08	5.65	6.94	2.59	1.58	2.62	.57	15.78	14.21	.09	1.33				
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh															
D10	82.88	78.34	78.96	83.40	86.13	70.21	79.64	15.00	12.00	.10	2.72	20	25	26	34
D11	85.40	80.98	81.08	84.35	86.48	71.19	80.43	19.50	17.00	.10	2.14	20	25	26	34
Avg.	84.14	79.66	80.02	83.88	86.31	70.70	80.04	17.25	14.50	.10	2.43				
Std Dv	1.78	1.87	1.50	.67	.25	.69	.56	3.18	3.54	.00	.41				
90% CI	7.96	8.33	6.69	3.00	1.10	3.09	2.49	14.21	15.78	.00	1.83				
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh															
D12	83.19	78.69	79.41	83.64	85.64	70.66	79.48	15.00	13.00	.10	2.01	20	25	26	35
D13	85.31	80.70	81.64	83.93	85.91	70.76	80.86	24.50	21.50	.10	1.98	20	25	26	34
Avg.	84.25	79.69	80.53	83.79	85.78	70.71	80.17	19.75	17.25	.10	2.00				
Std Dv	1.50	1.42	1.58	.21	.19	.07	.98	6.72	6.01	.00	.02				
90% CI	6.69	6.35	7.04	.92	.85	.32	4.36	29.99	26.83	.00	.09				
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh															
D14	84.23	80.69	81.09	84.18	86.19	71.31	81.06	19.00	14.50	.10	2.01	20	25	26	34
D15	85.60	80.97	82.24	84.44	86.49	71.73	81.04	22.50	22.00	.00	2.06	20	25	26	34
Avg.	84.92	80.83	81.66	84.31	86.34	71.52	81.05	20.75	18.25	.05	2.03				
Std Dv	.97	.20	.82	.18	.21	.30	.01	2.47	5.30	.07	.04				
90% CI	4.33	.88	3.64	.82	.95	1.33	.06	11.05	23.68	.32	.16				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation
Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-H-2-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 50.0 kts															
B17	86.13	84.32	85.27	87.11	88.80	76.98	80.62	13.50	14.00	.04	1.83	27	27	30	26
B18	85.52	83.36	84.75	86.03	87.21	74.75	80.44	20.00	19.00	.04	1.33	27	24	27	25
B19	88.51	86.85	87.22	88.09	88.97	77.80	83.20	17.50	17.50	.04	1.32	27	27	26	33
B20	86.94	85.41	87.30	88.26	89.18	77.52	83.38	19.00	18.00	.05	.88	26	26	24	23
B21	87.85	86.09	87.61	87.24	88.22	76.47	81.61	26.00	26.50	.05	.97	22	26	28	27
B22	86.92	85.72	86.10	85.44	86.38	75.31	81.33	24.00	24.50	.04	.90	23	23	28	26
Avg.	86.98	85.29	86.38	87.03	88.13	76.47	81.76	20.00	19.92	.04	1.21				
Std Dv	1.09	1.26	1.18	1.11	1.11	1.22	1.26	4.51	4.68	.01	.37				
90% CI	.90	1.04	.97	.92	.91	1.00	1.04	3.71	3.85	.00	.30				
TAKEOFF -- TARGET IAS 50.0 kts															
C29	81.49	79.01	80.09	79.59	81.30	68.33	80.54	30.00	26.00	.04	1.72	28	26	28	34
C30	81.24	78.49	80.44	79.42	80.80	68.07	79.01	34.50	34.00	.04	1.38	23	23	26	25
C31	81.67	79.22	79.88	79.39	80.80	68.19	79.14	29.50	27.50	.04	1.41	23	26	23	34
C32	81.56	79.14	79.85	79.44	81.10	68.31	79.45	28.50	27.50	.04	1.66	23	23	26	34
C33	81.63	78.66	79.29	79.27	80.57	68.23	79.77	25.50	36.50	.04	1.30	28	26	23	28
C34	82.09	79.64	79.90	79.88	81.20	68.76	79.26	26.00	23.50	.13	1.19	20	32	33	34
Avg.	81.61	79.03	79.91	79.50	80.96	68.32	79.53	29.00	29.17	.05	1.44				
Std Dv	.28	.41	.38	.21	.28	.24	.56	3.26	5.00	.04	.21				
90% CI	.23	.34	.31	.18	.23	.20	.46	2.68	4.11	.03	.17				
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh															
A1	82.75	80.16	79.91	83.12	84.24	71.78	77.45	13.00	14.00	.01	1.13	23	33	34	32
A2	85.09	82.48	82.72	82.78	84.37	71.26	77.61	28.00	24.50	.01	1.97	23	32	33	34
A3	82.39	79.73	80.72	83.63	84.99	72.27	82.12	14.00	14.00	.01	1.37	26	26	34	33
A5	84.94	82.44	82.58	82.65	84.59	71.79	77.40	24.00	23.00	.01	2.03	23	25	33	32
A6	82.69	80.15	80.33	83.30	84.51	72.04	81.47	13.50	13.00	.01	1.22	26	34	33	32
A7	84.71	81.94	81.84	82.03	83.80	70.96	77.08	24.50	24.50	.28	1.51	23	23	32	33
Avg.	83.76	81.15	81.35	82.92	84.42	71.68	78.86	19.50	18.83	.05	1.54				
Std Dv	1.27	1.27	1.20	.56	.40	.49	2.29	6.72	5.70	.11	.38				
90% CI	1.05	1.04	.98	.46	.33	.40	1.89	5.53	4.69	.09	.31				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-H-2-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh															
D8	83.84	81.29	81.95	84.70	86.24	73.50	84.06	14.00	12.50	.28	1.53	19	32	33	34
D9	85.43	83.18	83.39	83.54	84.90	73.08	80.46	21.50	22.00	.28	1.36	23	33	32	34
Avg.	84.63	82.24	82.67	84.12	85.57	73.29	82.26	17.75	17.25	.28	1.44				
Std Dv	1.12	1.34	1.02	.82	.95	.30	2.55	5.30	6.72	.00	.12				
90% CI	5.02	5.97	4.56	3.66	4.23	1.33	11.37	23.68	29.99	.00	.54				
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh															
D10	81.24	78.38	78.72	80.06	81.23	69.06	79.01	18.50	22.50	.01	1.27	23	26	23	34
D11	85.14	82.04	82.23	82.55	84.66	70.26	77.51	31.50	30.00	.00	2.12	23	23	32	25
Avg.	83.19	80.21	80.48	81.31	82.95	69.66	78.26	25.00	26.25	.00	1.69				
Std Dv	2.76	2.59	2.48	1.76	2.43	.85	1.06	9.19	5.30	.01	.60				
90% CI	12.31	11.55	11.09	7.86	10.83	3.79	4.74	41.04	23.68	.03	2.68				
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh															
D12	81.12	78.07	79.19	81.20	82.39	69.41	79.11	19.00	19.50	.03	1.17	23	26	33	34
D13	83.78	80.93	80.87	80.16	81.68	68.97	75.45	31.00	30.50	.03	2.15	23	23	33	32
Avg.	82.45	79.50	80.03	80.68	82.04	69.19	77.28	25.00	25.00	.03	1.66				
Std Dv	1.88	2.02	1.19	.74	.50	.31	2.59	8.49	7.78	.00	.69				
90% CI	8.40	9.03	5.32	3.28	2.24	1.39	11.55	37.88	34.73	.00	3.09				
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh															
D14	81.23	78.42	79.33	80.46	81.56	68.54	79.12	24.00	22.50	.03	1.13	23	34	26	35
D15	83.24	80.32	82.20	80.25	81.36	68.83	75.88	43.50	43.00	.04	1.07	23	32	34	33
Avg.	82.24	79.37	80.77	80.35	81.46	68.68	77.50	33.75	32.75	.04	1.10				
Std Dv	1.42	1.34	2.03	.15	.14	.21	2.29	13.79	14.50	.01	.04				
90% CI	6.35	6.00	9.07	.66	.63	.92	10.23	61.56	64.72	.03	.19				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: *Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.*

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-H-3-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 50.0 kts															
B17	83.93	80.91	82.49	84.00	85.45	71.88	77.92	23.00	22.50	.03	1.42	27	24	27	25
B18	82.83	80.19	81.56	81.24	83.19	70.10	75.27	28.00	27.50	.00	1.95	27	27	35	33
B19	84.58	81.72	83.13	83.06	85.01	71.59	77.62	28.50	28.00	.03	1.98	27	25	24	27
B20	86.29	83.84	84.15	83.68	85.06	72.93	78.03	26.50	26.00	.03	1.45	27	24	27	23
B21	85.57	83.27	83.38	82.59	84.20	71.48	77.29	31.00	30.00	.03	2.03	27	24	27	25
B22	85.55	83.28	83.82	82.42	84.85	71.85	77.40	31.50	27.50	.00	2.43	27	24	27	25
Avg.	84.79	82.20	83.09	82.83	84.63	71.64	77.25	28.08	26.92	.02	1.88				
Std Dv	1.27	1.48	.94	.99	.81	.91	1.01	3.12	2.52	.02	.38				
90% CI	1.04	1.22	.78	.81	.67	.75	.83	2.57	2.07	.01	.32				
TAKEOFF -- TARGET IAS 50.0 kts															
C29	82.87	79.64	80.27	78.74	80.58	67.05	74.75	42.00	37.50	.01	1.84	23	23	26	33
C30	82.34	79.25	78.85	77.85	80.05	65.79	73.61	40.50	35.50	.01	2.57	23	25	23	33
C31	82.59	79.48	79.52	78.30	80.24	66.51	73.80	40.00	37.00	.01	2.22	23	25	33	34
C32	82.87	79.58	79.87	79.59	81.58	67.97	74.43	31.00	29.00	.01	1.99	23	23	33	26
C33	82.17	79.17	81.41	78.92	80.63	67.94	73.56	44.50	44.00	.01	1.71	23	23	26	28
C34	82.72	79.61	79.48	78.75	81.34	67.18	73.77	34.00	32.50	.01	2.59	23	25	34	33
Avg.	82.59	79.45	79.90	78.69	80.74	67.07	73.99	38.67	35.92	.01	2.15				
Std Dv	.29	.20	.88	.59	.60	.84	.49	5.12	5.07	.00	.37				
90% CI	.24	.16	.72	.48	.50	.69	.40	4.21	4.17	.00	.31				
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh															
A1	82.50	80.14	80.04	81.53	82.88	70.75	77.31	17.00	17.50	.00	1.36	23	24	32	25
A2	83.82	81.11	81.37	82.57	84.11	71.26	81.53	20.50	20.00	.00	1.54	26	26	34	32
A3	82.75	80.48	80.55	82.79	84.19	71.26	77.34	17.00	17.00	.00	1.40	23	24	33	32
A5	83.45	80.99	81.60	82.74	83.93	71.82	80.70	19.00	19.00	.09	1.19	26	33	32	34
A6	82.58	80.22	80.59	81.23	82.35	70.28	76.67	21.50	21.00	.03	1.09	23	26	32	33
A7	83.24	80.37	80.87	81.62	82.95	70.46	80.26	22.00	26.50	.03	1.33	26	26	32	34
Avg.	83.06	80.55	80.84	82.08	83.40	70.97	78.97	19.50	20.17	.03	1.32				
Std Dv	.53	.41	.57	.70	.77	.58	2.09	2.19	3.44	.04	.16				
90% CI	.44	.33	.47	.57	.64	.48	1.72	1.80	2.83	.03	.13				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

TABLE A-H-3-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh															
D8	83.69	81.71	82.01	83.84	85.02	72.98	80.31	16.00	15.50	.21	.97	19	32	34	33
D9	84.90	82.58	83.37	85.43	86.83	74.48	83.93	15.50	16.00	.21	1.40	19	32	33	34
Avg.	84.29	82.15	82.69	84.63	85.93	73.73	82.12	15.75	15.75	.21	1.18				
Std Dv	.86	.62	.96	1.12	1.28	1.06	2.56	.35	.35	.00	.30				
90% CI	3.82	2.75	4.30	5.02	5.71	4.74	11.43	1.58	1.58	.00	1.36				
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh															
D10	81.68	79.06	79.40	79.90	81.20	68.43	74.98	25.00	24.50	.21	1.30	23	32	34	33
D11	82.82	80.36	80.98	80.92	82.17	69.68	79.16	27.00	22.50	.21	1.25	26	32	34	33
Avg.	82.25	79.71	80.19	80.41	81.68	69.06	77.07	26.00	23.50	.21	1.27				
Std Dv	.81	.92	1.12	.72	.69	.88	2.96	1.41	1.41	.00	.04				
90% CI	3.60	4.10	5.00	3.22	3.06	3.95	13.20	6.31	6.31	.00	.16				
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh															
D12	81.48	78.82	79.07	79.16	80.59	68.10	74.52	25.00	23.00	.21	1.48	23	32	34	33
D13	82.29	80.02	81.14	80.36	81.69	69.03	79.49	32.50	25.00	.21	1.32	26	26	33	34
Avg.	81.89	79.42	80.10	79.76	81.14	68.57	77.00	28.75	24.00	.21	1.40				
Std Dv	.57	.85	1.46	.85	.78	.66	3.51	5.30	1.41	.00	.11				
90% CI	2.56	3.79	6.53	3.79	3.47	2.94	15.69	23.68	6.31	.00	.51				
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh															
D14	81.02	78.33	78.26	78.65	79.80	67.47	74.57	24.00	24.50	.21	1.93	23	25	34	33
D15	82.28	79.52	80.10	79.81	80.98	68.13	78.51	31.50	29.00	.21	1.17	26	26	34	33
Avg.	81.65	78.93	79.18	79.23	80.39	67.80	76.54	27.75	26.75	.21	1.55				
Std Dv	.89	.84	1.30	.82	.83	.47	2.79	5.30	3.18	.00	.54				
90% CI	3.98	3.76	5.81	3.66	3.73	2.08	12.44	23.68	14.21	.00	2.40				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE, HUMIDITY, OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-I-1-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/24/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 50.0 kts															
B16	93.86	92.29	92.87	94.95	96.00	84.74	88.80	13.00	13.50	.00	1.05	28	28	25	29
B17	91.20	89.22	89.90	93.24	94.23	82.91	87.54	10.00	12.00	.11	.99	22	26	28	29
B18	92.11	90.25	90.82	94.61	95.52	84.29	88.73	9.00	10.00	.07	.84	22	25	28	27
B19	93.55	91.83	92.74	95.17	96.11	84.61	88.89	13.00	12.50	.00	.96	22	25	28	26
B20	92.79	91.46	92.75	92.57	93.73	83.21	86.04	18.00	18.50	.05	1.12	29	26	29	27
B21	93.30	91.69	92.25	93.58	94.19	83.22	87.84	16.00	16.50	.00	.60	24	28	25	24
Avg.	92.80	91.12	91.89	94.02	94.96	83.83	87.97	13.17	13.83	.04	.93				
Std Dv	1.00	1.16	1.24	1.04	1.04	.81	1.10	3.43	3.13	.05	.19				
90% CI	.82	.95	1.02	.86	.85	.66	.90	2.82	2.57	.04	.15				
TAKEOFF -- TARGET IAS 50.0 kts															
C22	80.91	77.93	77.45	79.50	80.45	67.24	76.71	21.00	21.50	.00	1.05	33	33	26	35
C23	80.10	77.23	77.64	79.56	80.68	67.23	76.56	22.00	19.50	.00	1.12	33	33	34	35
C24	80.76	77.80	77.58	79.72	80.63	67.37	76.79	21.00	21.50	.02	1.00	37	26	35	34
C25	80.69	77.77	77.73	79.31	80.12	67.03	76.51	23.50	24.50	.11	.70	33	26	33	34
C26	81.04	78.04	77.89	80.19	81.01	68.00	76.98	19.50	20.00	.01	.82	24	26	33	34
C27	80.10	77.27	77.31	79.20	80.16	67.00	75.92	21.50	19.50	.01	1.00	33	33	26	34
Avg.	80.60	77.67	77.60	79.58	80.51	67.31	76.58	21.42	21.08	.03	.95				
Std Dv	.41	.34	.20	.35	.34	.36	.36	1.32	1.91	.04	.16				
90% CI	.33	.28	.17	.29	.28	.30	.30	1.09	1.57	.03	.13				
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh															
A1	81.56	78.04	77.77	82.50	83.29	69.99	78.94	12.00	12.50	.00	.79	22	34	35	26
A2	81.86	78.50	78.47	82.59	83.51	69.87	79.48	14.50	14.00	.00	.92	22	34	35	36
A3	81.04	77.68	77.71	82.57	83.38	69.75	78.75	12.50	11.50	.00	.81	22	34	35	36
A4	81.92	78.49	78.51	82.49	83.38	69.76	79.43	15.00	15.00	.00	.88	24	34	35	26
A5	81.05	77.50	77.71	81.93	83.04	69.26	78.22	14.00	13.00	.00	1.23	29	35	34	36
A6	81.86	78.39	78.81	82.56	83.38	69.78	79.71	16.00	15.50	.00	.82	22	34	35	33
Avg.	81.55	78.10	78.16	82.44	83.33	69.74	79.09	14.00	13.58	.00	.91				
Std Dv	.41	.43	.49	.25	.16	.25	.56	1.52	1.53	.00	.16				
90% CI	.34	.36	.40	.21	.13	.21	.46	1.25	1.26	.00	.14				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-I-1-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/24/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX NOY BNDS (#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh															
D7	81.18	77.96	78.53	83.31	83.91	70.93	81.29	11.50	11.50	.08	.52	21	34	35	33
D8	81.23	77.99	78.11	82.50	83.09	70.15	80.76	12.50	13.50	.08	.59	24	34	26	33
Avg.	81.21	77.97	78.32	82.90	83.50	70.54	81.03	12.00	12.50	.08	.55				
Std Dv	.04	.02	.30	.57	.58	.55	.37	.71	1.41	.00	.05				
90% CI	.16	.09	1.32	2.56	2.59	2.46	1.67	3.16	6.31	.00	.22				
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh															
D9	80.28	76.67	76.52	81.10	82.68	68.23	78.64	13.50	12.00	.08	1.63	29	34	35	36
D10	81.00	77.41	77.76	80.93	82.20	68.22	78.79	18.00	16.50	.08	1.58	29	34	35	29
Avg.	80.64	77.04	77.14	81.01	82.44	68.23	78.71	15.75	14.25	.08	1.61				
Std Dv	.51	.52	.88	.12	.34	.01	.11	3.18	3.18	.00	.04				
90% CI	2.27	2.34	3.91	.54	1.52	.03	.47	14.21	14.21	.00	.16				
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh															
D11	80.22	76.53	77.18	80.44	81.68	67.52	78.95	18.50	17.50	.00	1.32	29	35	34	36
D12	81.31	77.78	78.04	81.31	82.07	68.50	79.62	18.00	17.50	.08	.92	22	34	35	33
Avg.	80.76	77.15	77.61	80.88	81.88	68.01	79.29	18.25	17.50	.04	1.12				
Std Dv	.77	.88	.61	.62	.28	.69	.47	.35	.00	.06	.28				
90% CI	3.44	3.95	2.72	2.75	1.23	3.09	2.12	1.58	.00	.25	1.26				
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh															
D13	80.49	76.71	77.01	80.12	81.07	67.12	79.45	19.50	20.00	.11	.84	22	35	34	36
D14	82.14	78.79	79.63	81.38	82.28	68.57	80.33	25.50	23.00	.11	.90	24	34	33	35
Avg.	81.32	77.75	78.32	80.75	81.68	67.85	79.89	22.50	21.50	.11	.87				
Std Dv	1.17	1.47	1.85	.89	.86	1.03	.62	4.24	2.12	.00	.04				
90% CI	5.21	6.57	8.26	3.98	3.82	4.58	2.78	18.94	9.47	.00	.19				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department of Transportation

Volpe Center Acoustics Facility

February 16, 1993

TABLE A-I-2-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER 4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/24/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 50.0 kts															
B16	88.21	86.96	87.75	87.33	88.26	76.96	82.00	24.00	23.00	.00	.93	28	26	28	27
B17	85.03	83.63	83.98	84.02	84.90	73.28	79.90	23.50	22.00	.00	.92	21	26	27	28
B18	88.23	86.82	87.33	87.59	88.88	77.67	81.93	18.50	19.50	.00	1.54	19	27	26	33
B19	87.88	86.57	87.19	87.61	88.82	77.19	82.07	20.00	19.50	.00	1.21	22	26	28	27
B20	85.50	84.26	85.61	84.24	84.91	74.64	79.92	25.00	25.00	.00	.91	19	28	27	26
B21	88.76	87.27	87.46	88.08	89.33	77.57	82.21	19.50	19.00	.00	1.25	22	26	27	28
Avg.	87.27	85.92	86.55	86.48	87.52	76.22	81.34	21.75	21.33	.00	1.13				
Std Dv	1.58	1.56	1.47	1.84	2.05	1.82	1.11	2.73	2.40	.00	.25				
90% CI	1.30	1.28	1.21	1.51	1.69	1.50	.91	2.25	1.98	.00	.21				
TAKEOFF -- TARGET IAS 50.0 kts															
C22	79.02	76.70	77.22	76.89	78.27	65.53	78.57	29.50	24.50	.01	1.38	19	26	34	33
C23	78.88	76.48	76.87	76.67	78.45	65.41	78.50	28.00	23.00	.09	1.88	19	26	34	29
C24	79.32	76.63	76.93	77.72	79.52	66.23	78.74	23.50	22.50	.01	1.80	19	26	34	33
C25	79.34	76.74	77.17	77.54	78.59	66.20	78.63	25.00	25.50	.01	1.05	19	34	26	33
C26	79.60	77.17	77.54	78.43	79.99	67.33	78.84	21.00	21.00	.01	1.56	19	33	34	26
C27	79.03	76.68	76.96	77.29	79.02	65.82	77.96	26.00	25.00	.01	1.93	19	26	34	32
Avg.	79.20	76.73	77.12	77.42	78.97	66.09	78.54	25.50	23.58	.02	1.60				
Std Dv	.27	.23	.25	.63	.67	.70	.31	3.07	1.72	.03	.34				
90% CI	.22	.19	.21	.52	.55	.57	.25	2.52	1.41	.03	.28				
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh															
A1	78.80	75.89	75.82	78.92	80.20	67.37	80.35	14.00	13.50	.09	1.19	19	26	33	34
A2	79.21	77.06	77.42	78.25	79.52	67.21	75.42	21.00	21.50	.01	1.28	19	34	33	32
A3	78.64	76.03	76.29	79.01	80.19	67.40	80.57	15.50	14.00	.01	1.39	19	34	26	33
A4	78.86	76.68	77.12	78.67	80.04	67.70	74.96	17.50	18.00	.01	1.38	19	34	26	33
A5	78.32	75.52	75.74	78.52	79.76	66.85	79.52	15.50	15.50	.07	1.17	19	26	33	34
A6	78.85	76.66	77.28	77.97	79.48	66.77	74.54	22.50	21.00	.03	1.47	19	34	33	32
Avg.	78.78	76.31	76.61	78.56	79.87	67.22	77.56	17.67	17.25	.04	1.31				
Std Dv	.29	.58	.75	.40	.32	.35	2.87	3.39	3.47	.04	.12				
90% CI	.24	.48	.62	.33	.27	.29	2.36	2.79	2.86	.03	.10				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-I-2-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/24/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh															
D7	80.55	77.85	78.37	81.87	83.51	70.08	83.33	13.50	12.00	.03	1.64	19	33	34	32
D8	79.74	77.80	78.15	79.38	80.71	68.37	78.91	19.00	19.00	.03	1.33	19	34	32	26
Avg.	80.15	77.82	78.26	80.63	82.11	69.23	81.12	16.25	15.50	.03	1.49				
Std Dv	.57	.04	.16	1.76	1.98	1.21	3.13	3.89	4.95	.00	.22				
90% CI	2.56	.16	.71	7.86	8.84	5.40	13.95	17.36	22.10	.00	.98				
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh															
D9	77.85	75.05	75.49	77.83	79.07	66.07	78.67	17.50	16.50	.10	1.14	26	33	26	34
D10	78.59	76.11	76.69	77.05	78.30	65.99	73.35	23.50	22.50	.10	1.34	19	26	34	33
Avg.	78.22	75.58	76.09	77.44	78.68	66.03	76.01	20.50	19.50	.10	1.24				
Std Dv	.52	.75	.85	.55	.54	.06	3.76	4.24	4.24	.00	.14				
90% CI	2.34	3.35	3.79	2.46	2.43	.25	16.80	18.94	18.94	.00	.63				
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh															
D11	78.01	75.28	75.22	76.72	77.89	65.01	78.90	21.00	21.00	.00	1.26	19	34	33	26
D12	78.66	75.98	76.53	76.20	77.41	64.84	73.33	29.50	29.50	.00	1.22	19	26	34	35
Avg.	78.34	75.63	75.87	76.46	77.65	64.93	76.12	25.25	25.25	.00	1.24				
Std Dv	.46	.49	.92	.37	.34	.12	3.94	6.01	6.01	.00	.03				
90% CI	2.05	2.21	4.12	1.64	1.52	.54	17.58	26.83	26.83	.00	.13				
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh															
D13	78.13	74.93	75.48	76.55	77.88	64.42	78.83	25.50	25.00	.00	1.33	19	34	33	26
D14	78.89	76.40	77.25	76.54	77.82	64.82	72.94	35.00	31.50	.00	1.28	19	34	35	33
Avg.	78.51	75.67	76.36	76.54	77.85	64.62	75.89	30.25	28.25	.00	1.31				
Std Dv	.54	1.04	1.26	.01	.04	.28	4.16	6.72	4.60	.00	.04				
90% CI	2.40	4.64	5.60	.03	.19	1.26	18.59	29.99	20.52	.00	.16				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-I-3-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/24/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX NOY BNDS (#)	(#)	(#)
APPROACH -- TARGET IAS 50.0 kts															
B16	85.16	82.98	84.66	81.78	83.46	71.39	77.29	42.50	36.00	.00	2.30	27	24	27	23
B17	84.88	82.74	83.95	82.57	84.45	72.26	77.59	29.50	29.50	.00	1.88	27	24	27	23
B18	82.65	80.60	83.38	82.15	82.84	70.06	76.53	43.00	28.00	.00	.75	24	24	26	27
B19	84.93	83.19	84.07	82.54	83.43	70.36	76.97	47.00	42.50	.00	1.72	27	24	27	25
B20	85.54	83.92	84.53	81.90	83.73	71.36	77.67	41.50	34.50	.00	1.83	27	24	27	23
B21	85.07	83.24	84.07	82.82	83.93	70.90	77.43	41.50	29.50	.06	1.06	27	23	27	26
Avg.	84.71	82.78	84.11	82.29	83.64	71.06	77.25	40.83	33.33	.01	1.59				
Std Dv	1.03	1.14	.46	.41	.54	.79	.43	5.91	5.48	.02	.57				
90% CI	.85	.94	.37	.34	.45	.65	.35	4.86	4.51	.02	.47				
TAKEOFF -- TARGET IAS 50.0 kts															
C22	79.28	76.90	77.37	76.02	78.07	65.13	73.58	33.50	32.00	.01	2.13	19	32	34	33
C23	78.80	76.31	77.20	75.52	76.61	65.03	72.74	33.00	34.00	.01	1.81	19	34	26	35
C24	78.56	76.00	77.10	76.31	77.29	64.86	73.23	33.50	32.50	.05	.93	26	35	26	33
C25	78.47	75.97	76.47	75.12	76.36	63.63	73.00	38.50	39.00	.05	2.05	19	34	32	35
C26	79.46	76.92	77.48	75.92	77.14	64.58	73.47	39.00	39.00	.05	1.89	19	34	35	33
C27	78.82	76.33	76.89	75.54	77.27	64.34	72.95	36.00	32.50	.05	1.83	19	34	35	33
Avg.	78.90	76.40	77.09	75.74	77.12	64.59	73.16	35.58	34.83	.04	1.77				
Std Dv	.39	.42	.36	.43	.60	.56	.32	2.67	3.30	.02	.43				
90% CI	.32	.34	.30	.35	.49	.46	.27	2.20	2.71	.02	.36				
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh															
A1	78.83	76.26	76.17	78.35	80.10	67.14	74.79	16.00	16.00	.00	1.78	19	34	32	33
A2	79.30	76.55	76.97	79.42	80.61	67.55	80.70	17.50	17.00	.04	1.15	26	26	33	34
A3	78.72	76.60	76.92	79.56	81.04	68.47	75.60	14.00	13.00	.04	1.47	19	26	34	33
A4	79.42	76.67	76.88	79.72	80.89	67.99	80.03	15.50	15.00	.03	1.13	26	33	26	34
A5	77.73	75.68	76.77	77.95	79.38	66.66	74.07	20.50	16.50	.03	1.51	19	34	33	32
A6	79.03	76.23	76.29	79.26	80.41	67.69	79.75	14.50	14.50	.03	1.15	26	26	33	34
Avg.	78.84	76.33	76.67	79.04	80.41	67.58	77.49	16.33	15.33	.03	1.36				
Std Dv	.61	.37	.35	.72	.60	.63	2.98	2.38	1.47	.01	.27				
90% CI	.50	.30	.28	.59	.50	.52	2.45	1.96	1.21	.01	.22				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-I-3-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/24/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh															
D7	79.07	77.13	77.63	79.96	81.43	69.18	79.14	14.00	14.00	.03	1.47	19	34	33	32
D8	80.65	77.95	78.22	81.31	82.83	69.77	83.24	14.00	14.00	.03	1.52	19	26	34	33
Avg.	79.86	77.54	77.93	80.63	82.13	69.47	81.19	14.00	14.00	.03	1.50				
Std Dv	1.12	.58	.42	.95	.99	.42	2.90	.00	.00	.00	.04				
90% CI	4.99	2.59	1.86	4.26	4.42	1.86	12.94	.00	.00	.00	.16				
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh															
D9	78.30	75.50	76.40	76.90	78.53	65.61	73.77	24.00	22.00	.00	1.71	19	34	33	35
D10	79.32	76.05	76.62	78.30	79.59	66.41	78.46	21.00	21.50	.03	1.32	37	33	34	26
Avg.	78.81	75.78	76.51	77.60	79.06	66.01	76.11	22.50	21.75	.01	1.52				
Std Dv	.72	.39	.16	.99	.75	.57	3.32	2.12	.35	.02	.28				
90% CI	3.22	1.74	.69	4.42	3.35	2.53	14.81	9.47	1.58	.09	1.23				
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh															
D11	78.65	75.15	75.76	76.36	78.10	64.79	73.09	25.00	25.00	.10	1.63	37	26	37	34
D12	79.56	76.11	77.11	78.55	79.54	66.41	79.03	23.50	28.50	.10	1.12	26	26	34	33
Avg.	79.10	75.63	76.43	77.46	78.82	65.60	76.06	24.25	26.75	.10	1.38				
Std Dv	.64	.68	.96	1.55	1.02	1.15	4.20	1.06	2.47	.00	.36				
90% CI	2.87	3.03	4.27	6.91	4.55	5.11	18.75	4.74	11.05	.00	1.61				
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh															
D13	77.86	75.23	75.63	75.56	76.94	63.52	72.99	32.50	29.50	.10	1.43	19	34	35	33
D14	79.44	76.40	77.32	78.00	79.25	66.10	78.89	26.50	27.50	.03	1.22	26	26	33	34
Avg.	78.65	75.82	76.48	76.78	78.10	64.81	75.94	29.50	28.50	.06	1.33				
Std Dv	1.12	.83	1.20	1.73	1.63	1.82	4.17	4.24	1.41	.05	.15				
90% CI	4.99	3.69	5.35	7.70	7.29	8.15	18.63	18.94	6.31	.22	.66				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-J-1-1

ENSTROM 280FX HELICOPTER
(PISTON ENGINE)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/26/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 50.4 kts															
BP9	87.17	85.12	85.20	89.50	89.50	76.60	85.94	14.50	13.00	.00	.00	24	21	24	22
BP10	89.66	87.25	88.10	91.40	92.24	79.35	87.74	15.00	13.00	.07	.83	24	22	21	24
BP11	87.35	84.44	84.86	89.01	89.87	75.83	85.45	16.00	13.50	.00	.89	21	21	24	22
BP12	88.97	86.62	87.68	91.44	92.23	79.90	87.16	12.00	11.50	.00	.79	20	25	21	26
BP13	89.43	87.15	87.76	91.26	92.12	79.80	86.81	12.50	12.50	.00	.86	20	24	26	21
BP14	89.25	86.72	87.00	91.04	91.88	79.04	86.71	12.50	12.00	.03	.81	21	21	26	25
Avg.	88.64	86.22	86.77	90.61	91.31	78.42	86.64	13.75	12.58	.02	.70				
Std Dv	1.09	1.16	1.40	1.07	1.27	1.75	.83	1.64	.74	.03	.34				
90% CI	.90	.95	1.15	.88	1.04	1.44	.68	1.35	.61	.02	.28				
TAKEOFF -- TARGET IAS 50.4 kts															
CP22	86.82	83.68	84.06	86.81	87.94	74.52	80.31	18.00	16.50	.00	1.13	20	32	35	33
CP23	86.64	83.71	84.68	86.64	87.99	74.07	79.88	23.00	17.00	.00	1.34	20	32	33	35
CP24	87.23	83.99	84.61	86.69	88.05	74.50	80.11	20.50	20.00	.00	1.36	20	32	33	25
CP25	86.64	83.58	84.31	85.67	86.92	73.34	79.62	25.00	22.50	.00	1.29	20	33	32	34
CP26	86.58	83.47	84.18	85.72	86.85	73.39	79.58	24.00	23.00	.03	1.10	20	32	25	33
CP27	87.01	83.79	85.15	86.80	88.00	74.64	80.15	22.50	22.00	.07	1.13	20	25	32	33
Avg.	86.82	83.70	84.50	86.39	87.63	74.08	79.94	22.17	20.17	.02	1.23				
Std Dv	.26	.18	.40	.54	.57	.58	.30	2.54	2.84	.03	.12				
90% CI	.21	.15	.33	.45	.47	.48	.25	2.09	2.34	.02	.10				
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh															
AP42	82.68	80.25	81.09	82.97	84.09	70.78	77.74	21.50	15.00	.07	1.13	20	32	33	26
AP43	83.70	80.98	82.11	83.84	84.98	71.60	78.29	22.50	17.50	.07	1.14	20	32	33	34
AP44	82.81	79.84	80.73	84.93	85.88	72.77	79.93	12.50	11.00	.07	.95	20	25	33	24
AP45	84.26	81.28	82.01	84.56	85.50	72.23	78.99	19.00	18.50	.07	1.07	20	32	33	35
AP46	82.48	79.98	81.07	82.95	84.11	70.66	77.70	22.00	16.00	.07	1.16	20	32	33	34
AP47	83.27	80.55	81.44	83.13	84.23	70.65	77.86	24.00	19.50	.07	1.10	25	25	32	33
Avg.	83.20	80.48	81.41	83.73	84.80	71.45	78.42	20.25	16.25	.07	1.09				
Std Dv	.68	.57	.55	.86	.77	.90	.89	4.13	3.05	.00	.08				
90% CI	.56	.47	.45	.71	.64	.74	.73	3.40	2.51	.00	.06				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

TABLE A-J-1-2

ENSTROM 280FX HELICOPTER (PISTON ENGINE)

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/26/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh															
DP48	83.05	80.55	80.80	84.18	85.18	72.05	78.53	15.00	13.00	.07	1.06	20	32	33	34
DP49	84.21	81.50	81.92	84.61	85.62	72.50	78.81	17.50	17.00	.07	1.01	20	32	33	34
Avg.	83.63	81.03	81.36	84.40	85.40	72.28	78.67	16.25	15.00	.07	1.03				
Std Dv	.82	.67	.79	.30	.31	.32	.20	1.77	2.83	.00	.04				
90% CI	3.66	3.00	3.53	1.36	1.39	1.42	.88	7.89	12.63	.00	.16				
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh															
DP51	82.68	79.71	81.02	84.59	85.51	72.42	80.27	14.50	13.50	.07	.92	20	25	26	24
DP52	83.68	80.76	81.49	83.74	85.00	71.49	78.91	20.00	18.50	.07	1.27	20	32	26	33
Avg.	83.18	80.24	81.26	84.16	85.26	71.96	79.59	17.25	16.00	.07	1.10				
Std Dv	.71	.74	.33	.60	.36	.66	.96	3.89	3.54	.00	.25				
90% CI	3.16	3.31	1.47	2.68	1.61	2.94	4.29	17.36	15.78	.00	1.10				
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh															
DP53	82.03	79.06	79.20	81.91	83.03	69.54	77.83	18.50	18.00	.09	1.06	20	25	32	33
DP54	83.53	80.70	81.76	82.76	84.02	70.70	78.69	25.50	19.00	.09	1.26	20	32	26	20
Avg.	82.78	79.88	80.48	82.34	83.52	70.12	78.26	22.00	18.50	.09	1.16				
Std Dv	1.06	1.16	1.81	.60	.70	.82	.61	4.95	.71	.00	.14				
90% CI	4.74	5.18	8.06	2.68	3.13	3.66	2.72	22.10	3.16	.00	.63				
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh															
DP55	82.03	79.07	80.55	83.61	84.46	71.52	79.23	16.00	16.00	.02	1.04	20	25	26	24
DP57	83.95	80.86	81.72	82.48	83.72	70.42	78.81	27.00	26.00	.07	1.24	20	32	26	24
Avg.	82.99	79.96	81.14	83.04	84.09	70.97	79.02	21.50	21.00	.05	1.14				
Std Dv	1.36	1.27	.83	.80	.52	.78	.30	7.78	7.07	.04	.14				
90% CI	6.06	5.65	3.70	3.57	2.34	3.47	1.33	34.73	31.57	.16	.63				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE, HUMIDITY, OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-J-2-1

ENSTROM 280FX HELICOPTER
(PISTON ENGINE)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/26/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
APPROACH -- TARGET IAS 50.4 kts															
BP9	85.36	83.50	83.63	85.37	86.32	73.97	80.34	18.50	17.50	.00	.95	23	23	26	28
BP10	85.44	83.17	82.91	84.55	85.46	73.25	79.99	18.50	18.50	.07	.98	23	24	23	27
BP11	85.19	83.19	83.38	85.36	86.20	74.09	80.23	17.00	17.00	.02	.83	23	23	26	28
BP12	85.59	83.53	83.66	85.50	86.40	74.12	80.62	18.00	17.50	.05	.85	23	23	26	24
BP13	84.87	82.75	82.92	84.04	84.97	72.81	79.12	20.50	20.00	.05	1.17	27	24	27	23
BP14	85.17	83.11	82.47	84.70	85.55	73.05	79.92	17.50	17.50	.05	.85	26	23	26	24
Avg.	85.27	83.21	83.16	84.92	85.82	73.55	80.04	18.33	18.00	.04	.94				
Std Dv	.25	.29	.47	.58	.58	.58	.51	1.21	1.10	.03	.13				
90% CI	.21	.24	.39	.48	.47	.48	.42	1.00	.90	.02	.11				
TAKEOFF -- TARGET IAS 50.4 kts															
CP22	84.55	81.89	83.17	81.19	82.92	70.62	75.43	36.00	36.00	.06	2.01	19	33	34	32
CP23	84.32	81.98	83.17	82.43	84.75	71.63	75.68	28.50	27.00	.06	2.32	19	34	33	28
CP24	84.21	81.96	83.41	81.96	83.97	71.37	75.46	32.00	26.00	.05	1.96	19	28	33	32
CP25	84.64	81.88	82.81	81.74	84.13	70.91	75.21	31.00	30.50	.02	2.38	19	34	28	32
CP26	84.14	81.50	81.96	80.82	83.39	70.20	74.82	30.00	28.00	.02	2.81	19	34	32	33
CP27	83.77	81.06	82.35	81.19	83.03	70.11	74.68	33.50	32.50	.03	1.82	19	34	33	32
Avg.	84.27	81.71	82.81	81.56	83.70	70.81	75.21	31.83	30.00	.04	2.22				
Std Dv	.31	.36	.56	.60	.71	.62	.39	2.66	3.78	.02	.36				
90% CI	.26	.30	.46	.49	.58	.51	.32	2.19	3.11	.02	.30				
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh															
AP42	80.69	78.95	79.41	80.64	81.62	70.25	74.69	16.50	18.50	.00	.98	22	32	33	26
AP43	84.02	81.88	82.51	83.71	84.38	72.30	77.69	21.00	20.00	.02	.68	22	32	33	26
AP44	80.08	78.44	79.34	81.18	82.16	70.18	74.66	16.50	17.00	.02	.98	26	26	32	33
AP45	84.42	82.44	83.05	84.04	85.08	72.84	77.72	21.00	18.50	.04	1.00	19	33	32	26
AP46	-	79.04	79.48	80.89	81.78	70.59	74.80	15.50	-	.00	.89	22	26	32	33
AP47	83.55	81.31	81.25	82.95	83.70	71.7[illegible]	76.85	18.00	19.50	.02	.73	19	32	33	26
Avg.	82.55	80.34	80.84	82.24	83.12	71.31	76.07	18.08	18.70	.02	.88				
Std Dv	2.01	1.73	1.67	1.51	1.47	1.13	1.51	2.40	1.15	.02	.14				
90% CI	1.92	1.42	1.37	1.24	1.21	.93	1.25	1.97	1.10	.01	.11				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

TABLE A-J-2-2

ENSTROM 280FX HELICOPTER (PISTON ENGINE)

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/26/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY BNDS		
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh															
AP48	81.15	79.60	79.87	81.28	82.30	70.98	75.36	15.50	16.00	.02	1.02	26	32	26	33
AP49	85.18	82.80	82.85	84.42	85.82	73.07	77.83	19.00	18.50	.02	1.40	19	26	33	32
Avg.	83.17	81.20	81.36	82.85	84.06	72.03	76.60	17.25	17.25	.02	1.21				
Std Dv	2.85	2.26	2.10	2.22	2.49	1.48	1.75	2.47	1.77	.00	.27				
90% CI	12.72	10.10	9.39	9.91	11.11	6.60	7.80	11.05	7.89	.00	1.20				
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh															
DP51	80.35	78.48	79.53	80.27	81.04	69.53	74.71	20.00	20.50	.02	.77	22	26	32	33
DP52	83.77	81.54	81.43	82.96	83.86	71.65	76.95	19.00	19.00	.02	1.18	26	26	23	33
Avg.	82.06	80.01	80.48	81.61	82.45	70.59	75.83	19.50	19.75	.02	.97				
Std Dv	2.42	2.16	1.34	1.90	1.99	1.50	1.58	.71	1.06	.00	.29				
90% CI	10.80	9.66	5.99	8.49	8.90	6.69	7.07	3.16	4.74	.00	1.29				
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh															
DP53	79.42	77.51	77.32	78.08	78.93	67.54	73.61	19.00	20.00	.02	1.02	22	26	22	33
DP54	83.79	81.46	82.13	82.27	83.49	71.07	76.69	25.50	25.00	.05	1.17	28	26	23	32
Avg.	81.60	79.49	79.72	80.18	81.21	69.31	75.15	22.25	22.50	.04	1.10				
Std Dv	3.09	2.79	3.40	2.96	3.22	2.50	2.18	4.60	3.54	.02	.11				
90% CI	13.80	12.47	15.18	13.23	14.40	11.14	9.72	20.52	15.78	.09	.47				
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh															
DP55	78.82	77.29	78.95	79.56	80.49	68.64	75.14	21.50	21.50	.02	.93	26	26	23	32
DP57	83.27	80.67	81.31	81.13	82.39	69.70	75.53	29.00	31.50	.05	1.27	28	23	26	33
Avg.	81.04	78.98	80.13	80.35	81.44	69.17	75.33	25.25	26.50	.04	1.10				
Std Dv	3.15	2.39	1.67	1.11	1.34	.75	.28	5.30	7.07	.02	.24				
90% CI	14.05	10.67	7.45	4.96	6.00	3.35	1.23	23.68	31.57	.09	1.07				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
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Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-J-3-1

ENSTROM 280FX HELICOPTER
(PISTON ENGINE)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/26/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
APPROACH -- TARGET IAS 50.4 kts															
BP9	82.71	79.69	80.04	82.14	83.27	69.73	76.79	21.50	20.00	.10	1.03	26	23	26	32
BP10	83.32	80.57	81.00	82.33	83.28	70.21	77.24	24.00	23.00	.10	.95	19	23	26	24
BP11	82.37	79.57	80.60	81.45	82.60	69.30	76.32	27.00	21.00	.10	1.15	26	26	23	22
BP12	82.82	80.01	80.66	82.42	83.53	70.25	76.83	22.00	19.00	.10	1.12	19	23	26	24
BP13	82.98	80.07	80.50	82.88	83.81	70.72	77.79	19.00	18.50	.10	.93	26	23	26	24
BP14	83.26	80.31	80.76	82.12	83.18	69.79	76.68	25.00	23.50	.10	1.06	19	23	26	32
Avg.	82.91	80.04	80.59	82.22	83.28	70.00	76.94	23.08	20.83	.10	1.04				
Std Dv	.36	.37	.32	.47	.40	.50	.51	2.84	2.07	.00	.09				
90% CI	.29	.31	.26	.39	.33	.41	.42	2.33	1.70	.00	.07				
TAKEOFF -- TARGET IAS 50.4 kts															
CP22	87.24	84.07	85.19	84.88	87.07	73.08	77.90	32.50	30.50	.05	2.14	19	35	33	32
CP23	87.25	84.25	84.55	85.87	88.04	74.24	78.92	21.50	20.50	.05	2.18	19	33	32	35
CP24	87.08	84.49	85.55	84.35	86.09	72.94	78.44	36.50	27.50	.05	1.69	19	33	32	22
CP25	87.35	84.08	84.58	85.49	87.67	73.70	78.20	24.50	22.50	.05	2.26	19	32	33	35
CP26	87.34	84.25	85.37	85.49	87.65	73.83	78.34	28.50	27.00	.05	2.17	19	33	32	35
CP27	87.33	84.06	85.36	84.63	86.90	73.25	77.88	32.50	31.00	.02	2.35	19	33	26	34
Avg.	87.27	84.20	85.10	85.12	87.24	73.51	78.28	29.33	26.50	.05	2.13				
Std Dv	.10	.17	.43	.59	.70	.50	.39	5.60	4.23	.01	.23				
90% CI	.08	.14	.35	.48	.58	.41	.32	4.61	3.48	.01	.19				
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh															
AP42	83.28	81.07	81.32	84.02	85.31	72.87	77.98	14.00	13.50	.00	1.29	19	32	26	33
AP43	81.46	79.88	80.40	80.83	81.99	70.51	75.10	19.50	19.00	.00	1.16	22	26	33	32
AP44	83.03	80.88	80.82	84.05	84.81	72.86	77.68	12.50	13.00	.00	.76	23	32	33	23
AP45	81.42	79.77	80.45	81.05	82.15	70.67	75.28	19.00	19.50	.00	1.10	22	26	33	32
AP46	82.99	81.01	81.55	83.32	83.93	72.26	77.50	17.00	17.00	.06	.55	19	26	32	33
AP47	81.33	79.76	80.56	81.34	82.36	70.56	75.71	20.00	20.00	.02	.99	22	26	32	33
Avg.	82.25	80.39	80.85	82.44	83.42	71.62	76.54	17.00	17.00	.01	.98				
Std Dv	.94	.65	.48	1.52	1.45	1.16	1.31	3.11	3.08	.02	.27				
90% CI	.77	.54	.40	1.25	1.19	.96	1.08	2.56	2.54	.02	.23				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-J-3-2

ENSTROM 280FX HELICOPTER
(PISTON ENGINE)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/26/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	----	------	------	------	------	-----	------	-----	------	------	------	-----	----	----	----
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh															
DP48	84.71	82.62	83.07	85.57	86.62	74.32	78.94	15.00	14.50	.03	1.02	19	32	33	26
DP49	82.03	80.46	80.99	81.86	83.09	71.45	76.22	18.00	18.00	.03	1.23	22	26	32	33
Avg.	83.37	81.54	82.03	83.71	84.85	72.88	77.58	16.50	16.25	.03	1.13				
Std Dv	1.90	1.53	1.47	2.62	2.50	2.03	1.92	2.12	2.47	.00	.15				
90% CI	8.46	6.82	6.56	11.71	11.14	9.06	8.59	9.47	11.05	.00	.66				
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh															
DP51	82.95	80.80	81.65	83.93	84.62	72.49	78.60	16.50	16.50	.07	.61	26	23	26	32
DP52	80.91	79.37	79.92	79.82	80.85	69.71	74.11	21.00	21.50	.07	1.15	26	26	32	33
Avg.	81.93	80.09	80.79	81.88	82.74	71.10	76.35	18.75	19.00	.07	.88				
Std Dv	1.44	1.01	1.23	2.91	2.67	1.97	3.17	3.18	3.54	.00	.38				
90% CI	6.44	4.51	5.47	12.98	11.90	8.78	14.17	14.21	15.78	.00	1.70				
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh															
DP53	-	75.59	75.80	81.20	82.25	70.06	75.64	7.50	-	.07	1.06	19	26	23	32
DP54	80.36	78.70	78.95	79.21	80.38	68.44	74.54	22.50	22.00	.05	1.13	26	26	23	33
Avg.	80.36	77.14	77.38	80.21	81.32	69.25	75.09	15.00	22.00	.06	1.10				
Std Dv	.00	2.20	2.23	1.41	1.32	1.15	.78	10.61	.00	.01	.05				
90% CI	.00	9.82	9.95	6.28	5.90	5.11	3.47	47.35	.00	.06	.22				
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh															
DP55	81.46	79.29	80.27	81.38	82.01	70.16	76.80	20.50	20.50	.02	.63	23	26	23	25
DP57	80.31	78.62	79.92	78.08	79.13	67.81	74.48	32.50	32.50	.05	1.11	22	23	22	33
Avg.	80.88	78.96	80.09	79.73	80.57	68.99	75.64	26.50	26.50	.04	.87				
Std Dv	.81	.47	.25	2.33	2.04	1.66	1.64	8.49	8.49	.02	.34				
90% CI	3.63	2.12	1.10	10.42	9.09	7.42	7.32	37.88	37.88	.09	1.52				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-K-1-1

ENSTROM TH28 HELICOPTER
(TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/26/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 55.0 kts															
BT1	90.81	89.14	89.12	91.53	92.59	80.23	85.98	15.50	14.00	.00	1.06	24	26	24	27
BT2	91.51	89.34	89.71	93.94	95.08	82.72	88.94	10.00	9.50	.04	1.11	22	26	22	27
BT4	91.41	89.58	90.74	92.81	93.84	81.85	88.35	15.50	14.50	.04	1.03	22	26	22	25
BT5	91.01	89.00	89.57	92.03	92.80	80.82	88.25	15.00	14.50	.01	.76	22	22	24	25
BT6	91.29	89.67	89.88	92.17	92.99	80.99	88.33	15.50	13.50	.01	.82	22	24	22	25
BT7	90.85	88.77	89.25	92.44	93.31	81.12	88.76	13.00	12.50	.01	.87	21	22	24	21
Avg.	91.15	89.25	89.71	92.49	93.43	81.29	88.10	14.08	13.08	.02	.94				
Std Dv	.30	.35	.58	.83	.92	.87	1.07	2.22	1.91	.02	.14				
90% CI	.24	.28	.48	.68	.75	.72	.88	1.83	1.57	.01	.12				
TAKEOFF -- TARGET IAS 55.0 kts															
CT16	90.26	86.75	86.83	90.48	92.04	78.38	84.15	14.00	13.50	.00	1.57	28	22	34	35
CT17	89.67	86.37	86.66	90.28	91.81	77.91	83.89	15.00	13.00	.10	1.43	22	22	35	34
CT18	89.46	86.26	87.19	90.95	92.37	78.74	84.57	14.00	12.00	.10	1.32	22	22	34	35
CT19	89.61	86.06	86.53	90.26	91.82	77.93	84.07	14.50	13.50	.01	1.55	28	22	28	34
CT20	89.39	86.35	86.58	89.89	91.53	77.83	83.71	15.00	13.50	.01	1.70	28	22	28	35
CT21	89.40	86.19	86.65	90.10	91.67	78.05	83.99	14.50	13.00	.01	1.57	22	22	28	35
Avg.	89.63	86.33	86.74	90.33	91.87	78.14	84.06	14.50	13.08	.04	1.52				
Std Dv	.33	.23	.24	.36	.30	.35	.29	.45	.58	.05	.13				
90% CI	.27	.19	.20	.30	.24	.29	.24	.37	.48	.04	.11				
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh															
AT28	84.54	81.91	82.19	85.96	87.26	74.23	80.46	12.50	11.50	.00	1.31	28	28	22	24
AT29	85.46	82.84	83.65	86.67	88.02	75.20	81.02	14.00	12.50	.00	1.35	28	28	22	34
AT30	84.68	82.13	82.44	86.06	87.12	74.84	80.78	11.50	12.00	.00	1.20	22	28	22	29
AT31	84.88	82.24	82.57	85.83	87.12	74.28	80.69	13.50	12.50	.00	1.28	22	22	28	27
AT32	84.16	81.57	81.61	85.91	86.98	74.01	80.60	11.50	11.00	.04	1.07	28	22	28	24
AT33	84.42	81.77	82.46	85.60	86.87	73.86	80.12	14.50	13.50	.10	1.16	28	22	28	27
Avg.	84.69	82.08	82.49	86.01	87.23	74.40	80.61	12.92	12.17	.02	1.23				
Std Dv	.45	.45	.67	.36	.41	.51	.31	1.28	.88	.04	.10				
90% CI	.37	.37	.55	.30	.34	.42	.25	1.05	.72	.03	.09				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-K-1-2

ENSTROM TH28 HELICOPTER (TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/26/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh															
DT34	86.01	83.04	83.18	87.77	88.92	76.19	82.06	10.00	9.50	.10	1.16	19	22	28	24
DT35	87.08	84.10	84.66	89.35	90.52	77.46	83.60	10.50	9.00	.07	1.09	28	22	28	24
Avg.	86.54	83.57	83.92	88.56	89.72	76.82	82.83	10.25	9.25	.09	1.13				
Std Dv	.76	.75	1.05	1.12	1.13	.90	1.09	.35	.35	.02	.05				
90% CI	3.38	3.35	[illegible]	4.99	5.05	4.01	4.86	1.58	1.58	.09	.22				
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh															
DT36	83.85	81.19	81.67	85.24	86.64	73.71	80.29	12.50	12.00	.07	1.39	28	28	22	27
DT37	85.01	82.33	82.53	85.47	86.85	73.78	80.69	15.00	13.50	.07	1.38	22	22	28	24
Avg.	84.43	81.76	82.10	85.35	86.74	73.74	80.49	13.75	12.75	.07	1.38				
Std Dv	.82	.81	.61	.16	.15	.05	.28	1.77	1.06	.00	.01				
90% CI	3.66	3.60	2.72	.73	.66	.22	1.26	7.89	4.74	.00	.03				
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh															
DT38	83.41	80.76	81.20	84.39	85.73	72.31	79.75	15.50	11.50	.07	1.34	22	22	28	27
DT39	84.43	82.02	82.66	84.21	85.56	72.77	79.49	19.50	16.50	.07	1.27	28	22	28	25
Avg.	83.92	81.39	81.93	84.30	85.65	72.54	79.62	17.50	14.00	.07	1.31				
Std Dv	.72	.89	1.03	.13	.12	.33	.18	2.83	3.54	.00	.05				
90% CI	3.22	3.98	4.60	.57	.54	1.45	.82	12.63	15.78	.00	.22				
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh															
DT40	83.88	81.40	81.84	84.94	85.97	73.09	80.80	15.00	13.50	.07	1.03	22	22	28	25
DT41	85.28	82.47	82.95	85.26	86.51	73.29	80.64	18.50	17.50	.07	1.25	22	22	28	27
Avg.	84.58	81.93	82.40	85.10	86.24	73.19	80.72	16.75	15.50	.07	1.14				
Std Dv	.99	.76	.79	.23	.38	.14	.11	2.47	2.83	.00	.16				
90% CI	4.42	3.38	3.51	1.01	1.70	.63	.51	11.05	12.63	.00	.69				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-K-2-1

ENSTROM TH28 HELICOPTER
(TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/26/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 55.0 kts															
BT1	87.92	85.73	85.48	87.88	89.10	76.06	82.57	17.50	16.50	.01	1.22	18	26	23	24
BT2	87.99	86.19	85.59	87.42	88.49	75.81	82.23	19.00	18.50	.00	1.06	26	26	23	24
BT4	87.48	85.38	85.42	86.78	88.03	75.21	82.13	21.00	18.00	.00	1.24	26	26	23	24
BT5	87.35	85.32	85.40	87.59	88.66	75.86	82.45	18.00	16.50	.00	1.13	26	26	23	24
BT6	86.72	84.75	84.97	87.08	88.18	75.31	82.14	18.50	14.00	.00	1.10	26	26	23	24
BT7	87.37	85.25	85.27	87.78	88.94	76.11	82.50	16.50	15.50	.00	1.16	26	26	23	24
Avg.	87.47	85.44	85.36	87.42	88.57	75.73	82.34	18.42	16.50	.00	1.15				
Std Dv	.46	.49	.21	.42	.42	.38	.19	1.53	1.64	.00	.07				
90% CI	.38	.40	.18	.35	.34	.31	.16	1.26	1.35	.00	.06				
TAKEOFF -- TARGET IAS 55.0 kts															
CT16	87.01	84.17	84.27	85.40	86.59	73.57	79.61	23.50	22.50	.00	1.19	22	26	22	34
CT17	86.69	84.22	85.33	85.08	86.37	73.72	79.39	29.00	22.50	.00	1.29	22	26	22	32
CT18	86.87	84.32	85.22	86.09	87.30	74.52	80.19	23.50	22.50	.00	1.21	22	26	22	34
CT19	86.65	83.96	84.21	85.22	86.67	73.51	79.79	23.50	23.00	.00	1.45	22	22	26	33
CT20	86.00	83.49	85.37	84.24	85.37	72.53	78.35	38.50	23.50	.06	1.06	26	26	22	23
CT21	86.29	83.68	84.13	84.20	85.49	72.44	78.79	29.50	25.50	.06	1.29	22	26	22	23
Avg.	86.58	83.97	84.76	85.04	86.30	73.38	79.35	27.92	23.25	.02	1.25				
Std Dv	.38	.33	.61	.72	.74	.78	.68	5.90	1.17	.03	.13				
90% CI	.31	.27	.50	.59	.61	.65	.56	4.86	.96	.03	.11				
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh															
AT28	83.99	81.94	82.16	84.15	85.12	73.27	77.71	15.50	15.00	.03	1.01	22	26	32	33
AT29	85.10	82.71	83.88	84.99	86.41	73.77	78.21	20.50	16.00	.03	1.50	19	26	33	32
AT30	83.75	81.69	82.20	84.81	85.87	73.75	78.06	14.00	13.50	.21	.85	18	26	32	33
AT31	84.18	81.46	81.59	83.08	84.20	71.59	77.31	20.00	20.00	.21	1.17	22	26	33	22
AT32	83.60	81.64	82.07	84.72	85.74	73.62	77.90	14.00	13.00	.06	.97	18	26	32	33
AT33	84.19	81.74	82.03	83.21	84.34	72.03	77.57	20.00	20.00	.06	1.13	22	26	33	32
Avg.	84.14	81.86	82.32	84.16	85.28	73.00	77.79	17.33	16.25	.10	1.11				
Std Dv	.53	.44	.79	.84	.88	.95	.33	3.16	3.09	.09	.23				
90% CI	.43	.36	.65	.69	.73	.78	.27	2.60	2.55	.07	.19				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-K-2-2

ENSTROM TH28 HELICOPTER
(TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/26/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX NOY		BNDS
--	----	------	------	------	------	-----	------	-----	------	------	------	----	----	----	----
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh															
DT34	85.01	83.06	83.15	85.75	86.94	75.02	79.00	13.00	12.50	.00	1.19	18	33	34	32
DT35	86.69	83.77	83.73	85.44	86.56	74.07	78.98	18.50	19.00	.05	1.08	22	26	32	33
Avg.	85.85	83.41	83.44	85.60	86.75	74.54	78.99	15.75	15.75	.03	1.13				
Std Dv	1.19	.50	.41	.22	.27	.67	.01	3.89	4.60	.04	.08				
90% CI	5.30	2.24	1.84	.98	1.20	3.00	.06	17.36	20.52	.16	.35				
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh															
DT36	82.37	80.44	80.12	81.77	83.19	70.70	76.70	17.50	16.50	.05	1.42	22	26	22	32
DT37	83.41	81.02	82.75	83.19	84.29	71.96	77.91	24.00	24.50	.05	1.10	22	26	22	33
Avg.	82.89	80.73	81.44	82.48	83.74	71.33	77.31	20.75	20.50	.05	1.26				
Std Dv	.74	.41	1.86	1.00	.78	.89	.86	4.60	5.66	.00	.23				
90% CI	3.28	1.83	8.31	4.48	3.47	3.98	3.82	20.52	25.26	.00	1.01				
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh															
DT38	81.65	79.73	80.33	81.04	82.11	70.02	75.91	21.50	20.50	.05	1.13	18	26	34	33
DT39	83.20	80.88	81.85	80.91	82.14	69.88	76.39	31.50	31.50	.05	1.24	22	26	22	33
Avg.	82.43	80.31	81.09	80.98	82.13	69.95	76.15	26.50	26.00	.05	1.18				
Std Dv	1.10	.81	1.07	.09	.02	.10	.34	7.07	7.78	.00	.08				
90% CI	4.89	3.63	4.79	.41	.09	.44	1.52	31.57	34.73	.00	.35				
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh															
DT40	81.10	79.30	79.76	80.00	81.27	69.15	75.84	23.00	19.50	.05	1.28	22	22	26	33
DT41	82.95	80.87	82.86	81.75	82.90	70.25	76.36	36.50	25.50	.00	1.14	22	26	33	22
Avg.	82.02	80.09	81.31	80.88	82.08	69.70	76.10	29.75	22.50	.03	1.21				
Std Dv	1.31	1.11	2.20	1.24	1.15	.78	.37	9.55	4.24	.04	.10				
90% CI	5.84	4.96	9.80	5.52	5.15	3.47	1.64	42.62	18.94	.16	.44				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-K-3-1

ENSTROM TH28 HELICOPTER
(TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/26/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 55.0 kts															
BT1	84.05	81.78	83.41	82.61	83.88	70.86	76.99	36.00	27.00	.00	1.27	26	26	23	28
BT2	83.01	80.85	81.55	81.36	82.10	70.01	75.58	28.50	28.00	.00	.74	19	26	27	33
BT4	84.33	81.73	82.53	82.66	83.68	70.84	77.26	29.50	27.00	.00	1.03	26	26	23	28
BT5	83.62	81.10	82.23	82.70	83.68	70.62	77.51	29.00	23.50	.00	.98	23	23	26	22
BT6	83.39	80.90	80.87	81.34	82.19	69.41	75.96	28.00	27.00	.00	.86	19	23	26	24
BT7	83.77	81.41	82.14	82.60	83.58	70.60	77.20	28.50	24.00	.00	.98	19	23	26	22
Avg.	83.69	81.30	82.12	82.21	83.18	70.39	76.75	29.92	26.08	.00	.98				
Std Dv	.47	.41	.86	.67	.81	.57	.79	3.02	1.86	.00	.18				
90% CI	.39	.34	.71	.55	.67	.47	.65	2.49	1.53	.00	.15				
TAKEOFF -- TARGET IAS 55.0 kts															
CT16	86.53	83.05	83.83	84.05	86.22	72.37	78.25	28.00	22.00	.00	2.17	19	26	22	33
CT17	87.27	83.71	84.57	84.82	86.80	73.11	79.05	28.00	24.50	.00	1.97	19	26	22	33
CT18	86.82	83.21	83.98	84.58	86.72	73.01	79.02	25.00	22.50	.00	2.18	19	26	22	33
CT19	87.62	83.89	83.91	85.25	87.35	73.80	79.20	20.50	20.00	.00	2.13	19	26	22	32
CT20	86.29	82.82	83.82	83.62	85.63	71.58	77.89	33.50	21.50	.00	2.01	19	22	26	34
CT21	85.87	82.27	82.90	83.46	85.49	71.84	78.05	25.50	22.00	.00	2.34	19	26	22	24
Avg.	86.73	83.16	83.83	84.30	86.37	72.62	78.58	26.75	22.08	.00	2.13				
Std Dv	.64	.59	.54	.70	.72	.84	.58	4.30	1.46	.00	.13				
90% CI	.53	.49	.44	.58	.59	.69	.47	3.54	1.20	.00	.11				
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh															
AT28	83.93	81.36	82.02	83.36	84.64	72.24	77.22	19.00	19.50	.17	1.16	19	26	32	33
AT29	84.00	82.08	82.69	84.26	85.44	73.27	77.82	17.50	16.50	.17	1.18	22	26	32	34
AT30	84.16	81.47	81.45	83.96	85.05	72.85	77.83	14.50	15.00	.11	.97	22	26	33	32
AT31	83.70	81.52	82.12	83.85	85.12	72.70	77.74	17.50	15.50	.11	1.27	22	26	32	33
AT32	83.13	80.63	80.94	82.93	84.09	71.78	77.10	16.50	16.00	.06	1.10	26	26	32	33
AT33	83.65	81.64	82.21	85.26	86.34	73.92	77.15	13.50	12.50	.06	1.07	18	34	33	35
Avg.	83.76	81.45	81.91	83.94	85.11	72.79	77.48	16.42	15.83	.11	1.13				
Std Dv	.36	.47	.62	.80	.76	.75	.35	2.06	2.27	.05	.10				
90% CI	.30	.39	.51	.66	.63	.62	.29	1.69	1.87	.04	.08				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE, HUMIDITY, OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 16, 1993

TABLE A-K-3-2

ENSTROM TH28 HELICOPTER
(TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/26/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh															
DT34	85.50	82.84	83.76	85.63	86.81	74.60	79.12	16.50	16.50	.14	1.04	26	26	33	32
DT35	86.03	83.77	83.91	86.87	88.00	75.78	80.07	13.00	13.00	.12	1.01	22	26	34	33
Avg.	85.76	83.30	83.84	86.25	87.40	75.19	79.60	14.75	14.75	.13	1.02				
Std Dv	.37	.66	.10	.88	.84	.83	.67	2.47	2.47	.01	.02				
90% CI	1.67	2.94	.46	3.91	3.76	3.73	3.00	11.05	11.05	.06	.09				
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh															
DT36	83.04	80.52	81.61	82.62	83.87	71.50	77.45	20.50	20.50	.12	1.25	22	26	22	32
DT37	83.54	81.35	81.25	82.41	83.67	71.14	77.17	20.50	20.50	.12	1.29	22	26	22	32
Avg.	83.29	80.93	81.43	82.51	83.77	71.32	77.31	20.50	20.50	.12	1.27				
Std Dv	.35	.59	.25	.15	.14	.25	.20	.00	.00	.00	.03				
90% CI	1.58	2.62	1.14	.66	.63	1.14	.88	.00	.00	.00	.13				
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh															
DT38	82.25	79.49	79.52	80.64	81.77	69.31	76.37	21.00	22.50	.09	1.04	22	22	23	26
DT39	82.87	80.89	81.57	81.58	82.76	70.60	76.10	25.00	24.50	.09	1.19	22	26	32	33
Avg.	82.56	80.19	80.55	81.11	82.26	69.96	76.24	23.00	23.50	.09	1.12				
Std Dv	.44	.99	1.45	.66	.70	.91	.19	2.83	1.41	.00	.11				
90% CI	1.96	4.42	6.46	2.97	3.13	4.07	.85	12.63	6.31	.00	.47				
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh															
DT40	81.39	79.15	79.64	80.58	81.67	69.03	75.93	23.00	22.00	.08	1.01	22	22	26	23
DT41	82.91	81.09	81.64	80.90	82.19	70.34	75.88	27.00	27.50	.08	1.29	22	26	32	33
Avg.	82.15	80.12	80.64	80.74	81.93	69.68	75.90	25.00	24.75	.08	1.15				
Std Dv	1.07	1.37	1.42	.23	.37	.93	.04	2.83	3.89	.00	.20				
90% CI	4.80	6.12	6.33	1.01	1.64	4.14	.16	12.63	17.36	.00	.88				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

U.S. Department of Transportation
Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-L-1-1

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 52.0 kts															
B15	89.14	88.81	89.32	89.05	90.48	78.44	83.40	24.50	15.50	.00	1.43	18	27	25	28
B16	90.87	89.11	90.65	90.48	91.77	79.27	84.79	27.50	26.00	.02	1.31	22	26	25	27
B17	95.23	93.85	94.19	94.54	96.09	84.41	88.22	19.00	18.50	.00	1.55	18	25	27	28
B18	95.61	94.05	94.81	96.09	97.66	86.36	88.93	14.00	14.50	.04	1.53	18	26	29	28
B19	91.31	89.60	89.95	89.88	91.01	79.25	84.67	23.50	24.00	.04	1.13	25	25	27	28
B20	93.80	92.51	94.08	95.78	96.99	85.63	89.28	14.00	13.00	.04	1.21	18	25	27	28
B21	94.62	93.48	93.75	94.93	95.61	85.46	88.13	13.50	16.00	.04	1.28	20	25	27	26
Avg.	92.94	91.63	92.39	92.96	94.23	82.69	86.77	19.43	18.21	.03	1.35				
Std Dv	2.49	2.36	2.32	3.03	3.03	3.52	2.40	5.80	4.96	.02	.16				
90% CI	1.83	1.73	1.70	2.22	2.23	2.58	1.76	4.26	3.64	.01	.12				
TAKEOFF -- TARGET IAS 52.0 kts															
C22	88.87	84.77	85.03	91.51	92.70	78.26	85.06	9.50	9.50	.04	1.18	22	25	22	35
C23	88.09	84.03	84.50	90.99	92.31	77.73	84.47	9.50	9.00	.00	1.32	20	25	34	35
C24	88.79	84.69	85.10	91.42	92.72	78.11	85.03	10.00	9.50	.04	1.30	20	25	35	34
C25	88.28	84.32	84.75	91.00	92.17	77.76	84.58	10.00	9.00	.04	1.18	20	25	36	35
C26	88.24	84.10	84.51	91.05	92.46	77.98	84.41	9.00	9.00	.04	1.41	20	25	34	33
C27	88.18	84.05	84.80	90.00	91.34	77.02	83.13	12.00	12.50	.04	1.34	22	25	22	34
Avg.	88.41	84.33	84.78	90.99	92.28	77.81	84.45	10.00	9.75	.03	1.29				
Std Dv	.33	.33	.25	.54	.51	.44	.70	1.05	1.37	.02	.09				
90% CI	.27	.27	.21	.44	.42	.36	.58	.86	1.13	.01	.08				
150 m FLYOVER -- TARGET IAS 81.9 kts -- 0.9Vh															
A1	80.74	76.98	77.26	81.46	82.59	68.66	75.72	14.50	15.00	.00	1.13	22	22	34	33
A2	81.16	77.60	77.50	81.04	82.01	68.47	75.88	16.00	16.50	.00	1.11	22	22	25	34
A3	80.83	77.40	77.93	80.84	81.82	68.27	75.89	18.50	16.00	.00	.98	22	25	22	26
A4	82.31	78.57	79.13	83.12	84.45	70.24	78.12	15.50	13.50	.00	1.32	22	25	22	35
A5	80.55	76.69	77.20	81.80	82.89	68.91	76.93	13.50	13.50	.00	1.09	22	25	22	24
A9	81.15	77.31	77.66	81.81	83.12	69.06	77.00	14.50	14.00	.00	1.31	22	22	25	34
Avg.	81.12	77.43	77.78	81.68	82.81	68.93	76.59	15.42	14.75	.00	1.16				
Std Dv	.63	.65	.71	.81	.94	.70	.94	1.74	1.29	.00	.13				
90% CI	.52	.53	.59	.67	.78	.58	.77	1.43	1.06	.00	.11				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

January 29, 1992

TABLE A-L-1-2

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 91.0 kts -- 1.0Vh															
A6	81.42	77.51	77.60	83.06	84.24	70.00	77.53	11.50	11.00	.00	1.27	22	22	34	35
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.8Vh															
A8	81.25	77.53	77.55	82.16	83.48	68.66	77.10	15.50	14.00	.00	1.32	22	22	34	35
A10	80.91	77.42	77.34	80.56	81.74	67.92	76.09	17.50	17.00	.03	1.18	22	25	22	26
Avg.	81.08	77.47	77.45	81.36	82.61	68.29	76.60	16.50	15.50	.01	1.25				
Std Dv	.24	.08	.15	1.13	1.23	.52	.71	1.41	2.12	.02	.10				
90% CI	1.07	.35	.67	5.05	5.49	2.34	3.19	6.31	9.47	.09	.44				
150 m FLYOVER -- TARGET IAS 63.7 kts -- 0.7Vh															
A11	82.34	78.76	79.67	82.86	83.79	70.25	77.91	17.50	17.00	.02	.93	22	25	22	26
A12	81.52	78.68	80.43	83.73	84.52	71.98	78.59	14.00	15.00	.07	.71	22	26	25	27
Avg.	81.93	78.72	80.05	83.29	84.15	71.12	78.25	15.75	16.00	.05	.82				
Std Dv	.58	.06	.54	.62	.52	1.22	.48	2.47	1.41	.04	.16				
90% CI	2.59	.25	2.40	2.75	2.30	5.46	2.15	11.05	6.31	.16	.69				
150 m FLYOVER -- TARGET IAS 54.6 kts -- 0.6Vh															
A13	82.87	79.55	79.83	82.71	83.60	70.17	77.86	18.50	18.50	.07	.89	22	25	26	22
A14	81.62	78.33	78.63	81.30	82.05	68.85	76.78	19.00	19.00	.07	.75	22	26	22	25
Avg.	82.25	78.94	79.23	82.01	82.82	69.51	77.32	18.75	18.75	.07	.82				
Std Dv	.88	.86	.85	1.00	1.10	.93	.76	.35	.35	.00	.10				
90% CI	3.95	3.85	3.80	4.45	4.89	4.17	3.41	1.58	1.58	.00	.44				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

TABLE A-L-2-1

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	----	------	------	------	------	-----	------	-----	------	------	-----	-----	-----	-----	-----
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 52.0 kts															
B15	86.35	85.34	85.86	85.07	86.20	75.45	80.40	22.00	24.00	.08	1.13	27	24	27	28
B16	86.63	85.66	87.15	84.35	85.92	75.69	79.77	28.00	29.00	.08	1.57	30	30	26	32
B17	86.70	85.38	87.34	86.20	88.11	76.55	79.71	24.00	24.00	.08	1.91	29	29	25	33
B18	86.63	84.62	85.86	83.74	85.94	73.75	78.82	32.50	32.00	.00	2.47	27	24	27	25
B19	88.42	87.34	90.03	88.15	89.93	78.97	81.97	25.50	30.00	.08	1.78	29	29	25	32
B20	84.99	83.05	83.59	82.62	85.02	72.05	78.89	28.50	28.00	.00	2.40	27	24	27	25
B21	87.01	84.73	86.52	85.28	87.31	75.06	79.62	28.00	25.50	.00	2.03	27	27	24	32
Avg.	86.68	85.16	86.62	85.06	86.92	75.36	79.88	26.93	27.50	.05	1.90				
Std Dv	1.01	1.29	1.95	1.78	1.67	2.17	1.07	3.43	3.10	.04	.47				
90% CI	.74	.95	1.43	1.31	1.23	1.59	.78	2.52	2.27	.03	.34				
TAKEOFF -- TARGET IAS 52.0 kts															
C22	82.96	80.51	80.43	81.92	83.10	70.89	76.09	18.00	18.00	.08	1.23	20	32	33	34
C23	82.10	79.49	79.80	81.39	82.97	69.69	76.25	20.50	20.00	.08	1.58	29	33	34	32
C24	83.67	81.39	82.60	84.38	85.00	72.94	77.70	18.50	19.00	.08	1.17	30	33	34	32
C25	82.40	80.03	80.05	81.10	82.49	69.94	77.27	20.50	20.00	.08	1.38	29	33	32	34
C26	83.30	81.07	81.42	83.84	85.05	72.26	77.48	16.50	16.00	.08	1.22	30	33	34	32
C27	82.41	79.83	80.57	81.84	82.46	70.57	76.15	20.00	21.00	.02	.59	18	34	33	32
Avg.	82.81	80.39	80.81	82.41	83.51	71.05	76.82	19.00	19.00	.07	1.20				
Std Dv	.61	.74	1.04	1.36	1.20	1.29	.74	1.61	1.79	.02	.33				
90% CI	.50	.61	.85	1.12	.99	1.06	.61	1.33	1.47	.02	.27				
150 m FLYOVER -- TARGET IAS 81.9 kts -- 0.9Vh															
A1	79.58	77.35	78.06	78.28	78.83	67.18	74.37	24.50	24.50	.00	.55	22	32	33	34
A2	78.81	76.12	76.91	77.68	79.28	66.30	76.81	23.00	21.50	.00	1.75	22	22	32	33
A3	79.26	76.81	77.29	78.60	79.65	66.59	74.94	23.50	22.00	.00	1.05	27	33	32	34
A4	79.67	76.95	77.57	79.03	80.30	67.46	78.17	20.50	18.00	.08	1.19	22	26	22	33
A5	78.68	76.25	76.46	77.34	78.20	66.15	74.41	21.50	24.00	.06	.79	26	32	33	34
A9	78.98	76.14	76.42	78.29	79.49	66.76	77.50	18.50	19.00	.01	1.29	22	22	26	32
Avg.	79.16	76.60	77.12	78.20	79.29	66.74	76.03	21.92	21.50	.03	1.10				
Std Dv	.41	.51	.64	.61	.72	.51	1.67	2.20	2.61	.04	.42				
90% CI	.34	.42	.53	.50	.59	.42	1.37	1.81	2.15	.03	.34				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation

Volpe Center Acoustics Facility

May 6, 1993

TABLE A-L-2-2

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
150 m FLYOVER -- TARGET IAS 91.0 kts -- 1.0Vh															
A6	79.63	76.86	77.39	78.79	80.31	66.78	77.66	23.00	21.00	.00	1.52	22	34	33	32
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.8Vh															
A8	78.95	76.44	76.43	78.31	79.10	66.77	76.27	18.50	18.50	.01	.78	21	26	27	32
A10	79.04	76.73	77.04	77.04	77.84	65.58	75.37	28.00	28.50	.06	.74	18	32	33	26
Avg.	78.99	76.59	76.74	77.68	78.47	66.18	75.82	23.25	23.50	.04	.76				
Std Dv	.06	.21	.43	.90	.89	.84	.64	6.72	7.07	.04	.03				
90% CI	.28	.92	1.93	4.01	3.98	3.76	2.84	29.99	31.57	.16	.13				
150 m FLYOVER -- TARGET IAS 63.7 kts -- 0.7Vh															
A11	79.81	77.12	77.51	78.08	79.05	66.21	77.17	27.00	26.00	.06	.97	26	26	23	22
A12	78.65	76.35	76.65	77.41	78.38	65.86	75.02	24.00	21.50	.08	.89	18	33	32	34
Avg.	79.23	76.74	77.08	77.75	78.71	66.04	76.10	25.50	23.75	.07	.93				
Std Dv	.82	.54	.61	.47	.47	.25	1.52	2.12	3.18	.01	.06				
90% CI	3.66	2.43	2.72	2.12	2.12	1.10	6.79	9.47	14.21	.06	.25				
150 m FLYOVER -- TARGET IAS 54.6 kts -- 0.6Vh															
A13	79.80	77.15	78.10	79.35	80.74	68.56	76.84	18.00	18.50	.08	1.38	27	27	24	25
A14	78.55	76.11	76.52	76.17	77.01	65.06	72.57	28.00	30.00	.08	.84	19	32	33	26
Avg.	79.18	76.63	77.31	77.76	78.88	66.81	74.71	23.00	24.25	.08	1.11				
Std Dv	.88	.74	1.12	2.25	2.64	2.47	3.02	7.07	8.13	.00	.38				
90% CI	3.95	3.28	4.99	10.04	11.78	11.05	13.48	31.57	36.31	.00	1.70				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE, HUMIDITY, OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-L-3-1

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

EV	EPNL	SEL	SEL(s)**	PNLm	PNLTm	ALm	OASPLm	DUR(A)	DUR(P)	BNDSHR	TC	BND	MAX	NOY	BNDS
--	----	------	------	------	------	-----	------	-----	------	------	-----	-----	----	----	----
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(Sec)	(Sec)	(dB)	(dB)	(#)	(#)	(#)	(#)
APPROACH -- TARGET IAS 52.0 kts															
B15	87.62	86.58	88.19	87.38	88.68	77.68	82.55	22.50	19.50	.00	1.30	27	27	28	24
B16	88.41	87.18	88.56	87.12	88.44	77.02	82.70	28.50	27.50	.00	1.42	18	27	26	28
B17	88.39	87.66	88.23	87.52	89.01	78.23	81.97	20.00	20.50	.00	1.49	18	28	29	27
B18	89.45	88.76	90.14	89.10	89.99	79.35	84.20	24.00	24.50	.03	.86	18	27	26	28
B19	87.96	86.88	86.91	86.48	88.29	76.30	81.82	23.00	21.00	.03	1.97	27	27	24	26
B20	88.20	87.28	89.77	88.76	89.84	79.66	84.06	20.50	22.00	.11	.97	18	28	27	26
B21	87.54	86.75	88.27	87.60	88.29	77.57	82.15	23.50	24.00	.25	.44	19	27	26	28
Avg.	88.22	87.30	88.58	87.71	88.93	77.97	82.78	23.14	22.71	.06	1.21				
Std Dv	.64	.74	1.08	.92	.72	1.21	.97	2.79	2.78	.09	.50				
90% CI	.47	.54	.79	.67	.53	.89	.72	2.05	2.04	.07	.36				
TAKEOFF -- TARGET IAS 52.0 kts															
C22	83.32	80.47	81.05	82.55	84.02	70.84	79.20	21.00	20.50	.00	1.47	22	32	33	34
C23	83.48	80.35	80.54	81.91	83.75	70.13	79.86	22.00	25.00	.08	1.76	22	32	34	33
C24	83.97	80.92	81.13	82.04	83.87	70.52	79.49	23.00	26.00	.00	1.83	22	32	34	33
C25	83.37	80.59	81.17	82.77	84.13	71.17	79.94	20.00	20.00	.04	1.32	22	32	33	34
C26	83.56	80.71	81.15	83.01	84.01	71.26	80.13	19.50	20.00	.04	1.01	25	33	32	34
C27	82.94	80.00	79.16	80.55	81.96	68.65	79.10	22.50	22.00	.01	1.95	22	27	34	32
Avg.	83.44	80.51	80.70	82.14	83.62	70.43	79.62	21.33	22.25	.03	1.56				
Std Dv	.34	.32	.79	.88	.83	.97	.42	1.40	2.64	.03	.36				
90% CI	.28	.26	.65	.73	.68	.80	.35	1.15	2.17	.03	.29				
150 m FLYOVER -- TARGET IAS 81.9 kts -- 0.9Vh															
A1	79.49	76.47	76.64	78.51	79.63	66.43	76.93	21.00	20.50	.02	1.10	26	26	22	32
A2	79.46	77.21	77.53	78.12	79.35	66.92	73.30	23.00	23.00	.02	1.23	27	32	33	34
A3	79.66	76.66	77.70	78.69	80.08	67.00	76.97	23.50	21.50	.02	1.49	22	22	26	32
A4	80.02	77.51	77.77	78.52	80.00	67.36	75.09	22.00	22.00	.02	1.57	27	32	33	34
A5	79.14	76.13	76.75	78.53	79.66	66.34	76.99	22.00	20.50	.02	1.13	26	26	34	33
A9	79.63	77.25	77.65	78.45	79.23	67.65	75.03	20.00	21.00	.03	.75	22	32	33	34
Avg.	79.57	76.87	77.34	78.47	79.66	66.95	75.72	21.92	21.42	.02	1.21				
Std Dv	.29	.53	.51	.19	.34	.51	1.51	1.28	.97	.00	.30				
90% CI	.24	.44	.42	.16	.28	.42	1.24	1.05	.80	.00	.24				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

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Volpe Center
Acoustics Facility

May 6, 1993

TABLE A-L-3-2

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
AS MEASURED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

EV	EPNL (dB)	SEL (dB)	SEL(s)** (dB)	PNLm (dB)	PNLTm (dB)	ALm (dB)	OASPLm (dB)	DUR(A) (Sec)	DUR(P) (Sec)	BNDSHR (dB)	TC (dB)	BND (#)	MAX (#)	NOY (#)	BNDS (#)
150 m FLYOVER -- TARGET IAS 91.0 kts -- 1.0Vh															
A6	79.57	77.21	77.58	79.11	80.05	68.42	74.17	16.50	18.50	.02	.98	26	26	33	32
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.8Vh															
A8	79.13	76.74	77.61	78.40	79.41	67.72	73.70	19.50	20.50	.02	1.02	26	26	32	33
A10	79.55	76.64	77.95	79.56	81.07	68.29	76.49	18.50	17.50	.19	1.32	22	27	28	24
Avg.	79.34	76.69	77.78	78.98	80.24	68.01	75.10	19.00	19.00	.10	1.17				
Std Dv	.30	.07	.24	.82	1.17	.40	1.97	.71	2.12	.12	.21				
90% CI	1.33	.32	1.08	3.66	5.24	1.80	8.81	3.16	9.47	.54	.95				
150 m FLYOVER -- TARGET IAS 63.7 kts -- 0.7Vh															
A11	79.34	76.82	77.42	78.31	79.42	66.81	73.63	23.00	21.00	.19	1.11	26	26	33	34
A12	-	76.33	77.46	80.20	81.06	68.30	77.42	16.50	-	.02	.84	26	26	23	22
Avg.	79.34	76.57	77.44	79.25	80.24	67.56	75.52	19.75	21.00	.10	.98				
Std Dv	.00	.35	.03	1.34	1.16	1.05	2.68	4.60	.00	.12	.19				
90% CI	.00	1.55	.15	5.97	5.18	4.70	11.97	20.52	.00	.54	.85				
150 m FLYOVER -- TARGET IAS 54.6 kts -- 0.6Vh															
A13	79.75	77.23	78.94	78.38	79.19	67.56	73.22	27.50	27.50	.02	.80	23	33	32	34
A14	79.41	76.62	77.18	78.10	79.20	65.88	76.82	27.00	25.50	.02	1.10	22	22	23	26
Avg.	79.58	76.93	78.06	78.24	79.19	66.72	75.02	27.25	26.50	.02	.95				
Std Dv	.24	.43	1.24	.20	.01	1.19	2.55	.35	1.41	.00	.21				
90% CI	1.07	1.93	5.56	.88	.03	5.30	11.37	1.58	6.31	.00	.95				

* - NOISE INDEXES CALCULATED USING AS MEASURED DATA UNCORRECTED FOR TEMPERATURE,HUMIDITY,OR AIRCRAFT DEVIATION FROM REFERENCE TRACK

** - SEL(s)= Simplified SEL = ALm + 10.0*LOG(DUR(A)/2.0

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

APPENDIX B

CORRECTED NOISE LEVEL DATA

This Appendix presents the corrected noise level data, including EPNL, SEL, AL_{MAX}, and $PNLT_{MAX}$, by site, date, and helicopter configuration, Tables B-A-1-1* through B-L-3-2.

*In the numerical notation for Table number, the *first letter* denotes Appendix, the second letter denotes helicopter configuration (as discussed in Section 1.4), the first number denotes site, i.e., site 1 - centerline, site 2 - sideline/east, or site 3 - sideline/west, and the second number differentiates between standard Far Part 36 tests (denoted by a 1) and additional flyover tests (denoted by a 2). For example, Table B-A-1-1 contains noise data measured for helicopter Configuration A (Schweizer, Standard Configuration) at the centerline measurement site, subject to standard FAR Part 36 requirements.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-A-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B1	93.90	90.88	81.66	94.78	-.03	-.06	-.77	.00	92.4	117.1	117.2	118.2	118.3	17.5	21.1	N-S
B2	93.45	89.17	78.37	93.27	-.28	-.71	-.53	.00	127.5	114.0	143.7	118.2	149.0	18.0	21.1	N-S
B3	92.75	89.16	78.66	92.75	-.17	-.23	-.23	.00	118.2	115.5	131.1	118.2	134.2	19.5	21.1	N-S
B4	92.05	88.23	79.45	93.07	-.27	-.37	-.17	.00	103.2	114.0	117.1	118.2	121.4	19.5	21.1	N-S
B5	92.87	89.60	80.61	94.23	-.21	-.25	-.19	.00	120.4	114.6	132.8	118.2	137.0	19.5	21.1	N-S
B6	94.09	90.36	79.98	93.77	-.40	-.88	.00	.00	96.6	112.5	113.2	118.2	119.0	20.1	21.1	N-S
Avg.	93.18	89.57	79.79	93.64	-.23	-.42	-.32	.00	109.7	114.6	125.9	118.2	129.8	19.0	21.1	
Std Dv	.77	.94	1.23	.76	.12	.31	.28	.00	14.3	1.6	11.9	.0	12.3	1.0	.0	
90% CI	.63	.78	1.02	.63	.10	.26	.23	.00	11.7	1.3	9.8	.0	10.1	.8	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C1	95.63	91.47	79.93	94.92	.55	.45	-.78	.00	119.4	114.2	131.1	109.1	125.2	18.0	20.6	N-S
C5	96.33	92.30	80.49	95.36	.80	.76	-.51	.00	128.5	116.6	149.1	109.1	139.5	19.5	20.6	N-S
C6	96.73	92.68	81.14	95.96	.20	.17	-.48	.00	127.1	109.7	137.6	109.1	136.8	18.5	20.6	N-S
C7	96.81	92.53	81.03	95.89	2.18	1.87	-1.09	.00	132.7	129.8	176.6	109.1	148.5	19.0	20.6	N-S
C8	95.82	91.75	80.12	94.92	.64	.52	-.51	.00	140.6	113.4	178.8	109.1	172.1	19.0	20.6	N-S
C9	96.12	92.14	80.97	95.75	.51	.48	-.88	.00	122.2	113.3	133.9	109.1	128.9	17.5	20.6	N-S
Avg.	96.24	92.14	80.61	95.47	.81	.71	-.71	.00	128.4	116.2	151.2	109.1	141.8	18.6	20.6	
Std Dv	.48	.46	.51	.47	.70	.60	.25	.00	7.6	7.0	21.4	.0	16.9	.7	.0	
90% CI	.39	.38	.42	.39	.57	.49	.21	.00	6.2	5.8	17.6	.0	13.9	.6	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	90.88	86.70	76.57	91.52	-.01	-.02	-.49	.46	123.7	148.2	178.1	148.8	178.8	32.9	37.0	N-S
A2	90.93	86.66	76.30	91.27	.54	.23	.46	.46	134.3	156.0	218.1	148.8	208.0	43.2	37.0	S-N
A3	90.90	86.80	76.84	91.70	.36	.34	-.93	.53	124.5	153.5	186.3	148.8	180.5	30.9	37.0	N-S
A4	90.85	86.51	77.40	92.08	.30	.14	.34	.39	108.3	153.0	161.2	148.8	156.7	41.2	37.0	S-N
A5	90.65	86.33	77.33	92.17	.32	.29	-.69	.46	69.3	152.7	163.2	148.8	159.0	32.4	37.0	N-S
A6	90.83	86.70	76.50	91.07	.75	.71	.05	.46	109.1	159.4	168.7	148.8	157.4	40.1	37.0	S-N
Avg.	90.84	86.62	76.82	91.64	.38	.28	-.21	.46	111.5	153.8	179.3	148.8	173.4	36.8	37.0	
Std Dv	.10	.17	.45	.44	.25	.25	.57	.04	23.0	3.7	21.2	.0	20.1	5.3	.0	
90% CI	.08	.14	.37	.36	.21	.20	.47	.04	18.9	3.1	17.5	.0	16.5	4.4	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-A-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D1	91.56	87.58	78.25	93.00	.47	.44	-.76	.81	113.2	155.1	168.8	148.8	161.9	36.0	41.2	N-S
D2	91.73	87.64	77.98	92.49	.87	.82	-.08	.81	113.9	161.0	176.1	148.8	162.7	43.7	41.2	S-N
Avg.	91.64	87.61	78.12	92.74	.67	.63	-.42	.81	113.6	158.1	172.5	148.8	162.3	39.8	41.2	
Std Dv	.12	.04	.19	.36	.28	.27	.48	.00	.5	4.2	5.2	.0	.6	5.4	.0	
90% CI	.54	.19	.85	1.61	1.26	1.20	2.15	.00	2.2	18.6	23.0	.0	2.5	24.3	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D5	89.95	85.59	76.59	91.71	.88	.83	-1.16	.17	124.6	161.0	195.6	148.8	180.7	27.3	32.9	N-S
D6	90.45	86.26	76.81	91.88	.73	.32	.02	.17	31.2	157.2	303.5	148.8	287.3	35.0	32.9	S-N
Avg.	90.20	86.07	76.70	91.79	.81	.57	-.57	.17	77.9	159.1	249.6	148.8	234.0	31.1	32.9	
Std Dv	.35	.26	.16	.12	.11	.36	.83	.00	66.0	2.7	76.3	.0	75.4	5.4	.0	
90% CI	1.58	1.17	.69	.54	.47	1.61	3.73	.00	294.9	12.0	340.6	.0	336.5	24.3	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D7	90.96	86.66	75.75	90.80	.70	.50	-.03	.13	128.1	157.8	200.6	148.8	189.0	30.3	28.8	N-S
D8	90.62	86.41	76.18	91.15	1.04	.97	-.39	.07	127.9	162.7	206.3	148.8	188.6	30.9	28.8	S-N
Avg.	90.79	86.54	75.97	90.98	.87	.74	-.21	.10	128.0	160.3	203.5	148.8	188.8	30.6	28.8	
Std Dv	.24	.18	.30	.25	.24	.33	.26	.04	.1	3.5	4.0	.0	.3	.4	.0	
90% CI	1.07	.79	1.36	1.05	1.07	1.48	1.14	.19	.6	15.5	18.0	.0	1.3	1.9	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D9	90.57	86.38	76.84	91.91	.69	.62	-1.15	.01	121.1	157.6	184.0	148.8	173.6	20.1	24.7	N-S
D10	91.43	87.29	75.51	90.20	.86	.70	.01	.00	100.8	160.9	163.8	148.8	151.4	26.7	24.7	S-N
Avg.	91.00	86.84	76.18	91.06	.77	.66	-.57	.00	110.9	159.3	173.9	148.8	162.5	23.4	24.7	
Std Dv	.61	.64	.94	1.21	.12	.06	.82	.01	14.4	2.3	14.3	.0	15.7	4.7	.0	
90% CI	2.72	2.87	4.20	5.40	.54	.25	3.66	.03	64.1	10.4	63.8	.0	70.1	20.8	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

TABLE B-A-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B1	88.29	85.81	76.48	87.98	-.41	-.38	-.61	.00	69.2	182.4	195.1	191.0	204.2	17.5	21.1	N-S
B2	86.87	83.29	71.04	84.42	-.06	-.94	-.63	.00	124.3	188.4	227.9	191.0	231.1	18.0	21.1	N-S
B3	87.36	84.43	72.36	85.21	.01	-.02	-.29	.00	112.2	189.3	204.4	191.0	206.2	19.5	21.1	N-S
B4	86.52	82.53	71.14	84.10	.00	-1.09	-.27	.00	120.2	188.4	218.0	191.0	221.0	19.5	21.1	N-S
B5	86.77	83.56	72.38	85.36	-.06	-.57	-.27	.00	118.0	188.4	213.3	191.0	216.3	19.5	21.1	N-S
B6	87.63	83.67	70.38	84.18	-.07	-1.41	-.14	.00	126.2	187.4	232.4	191.0	236.7	20.1	21.1	N-S
Avg.	87.24	83.88	72.30	85.21	-.10	-.73	-.37	.00	111.7	187.4	215.2	191.0	219.3	19.0	21.1	
Std Dv	.66	1.13	2.20	1.46	.16	.51	.20	.00	21.4	2.5	14.1	.0	13.1	1.0	.0	
90% CI	.54	.93	1.81	1.20	.13	.42	.17	.00	17.6	2.1	11.6	.0	10.7	.8	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C1	91.04	87.48	74.76	87.61	.29	.14	-.59	.00	102.9	186.1	190.9	185.5	190.3	18.0	20.6	N-S
C5	92.74	88.93	76.63	90.31	.37	.03	-.31	.00	110.2	189.5	201.9	185.5	197.6	19.5	20.6	N-S
C6	91.42	87.91	74.59	87.92	.21	.06	-.48	.00	85.8	186.3	186.8	185.5	185.9	18.5	20.6	N-S
C7	92.15	88.48	75.40	88.86	1.05	.87	-.64	.00	114.1	198.6	217.4	185.5	203.1	19.0	20.6	N-S
C8	91.63	87.78	74.39	88.60	.90	.26	-.48	.00	142.2	191.6	312.6	185.5	302.6	19.0	20.6	N-S
C9	91.64	88.20	75.30	88.71	.64	.46	-.83	.00	107.2	190.6	199.6	185.5	194.2	17.5	20.6	N-S
Avg.	91.77	88.13	75.18	88.67	.58	.30	-.56	.00	110.4	190.4	218.2	185.5	212.3	18.6	20.6	
Std Dv	.60	.52	.81	.94	.34	.32	.18	.00	18.4	4.6	47.4	.0	44.6	.7	.0	
90% CI	.49	.43	.67	.77	.28	.26	.15	.00	15.2	3.8	39.0	.0	36.7	.6	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	87.27	84.04	72.06	84.88	-.08	-.07	-.47	.88	117.7	209.1	236.0	211.2	238.5	32.9	37.0	N-S
A2	88.82	84.30	72.55	86.83	.93	-.13	.39	.57	137.5	225.1	333.4	211.2	312.9	43.2	37.0	S-N
A3	-	83.55	71.92	85.14	-.07	-.52	-.75	1.00	122.1	209.2	246.9	211.2	249.2	30.9	37.0	N-S
A4	88.63	84.99	74.05	87.37	.48	.46	.27	.48	101.1	220.5	224.8	211.2	215.3	41.2	37.0	S-N
A5	88.02	84.57	72.45	85.88	-.19	-.18	-.49	.88	73.1	206.9	216.2	211.2	220.7	32.4	37.0	N-S
A6	-	84.45	73.08	86.20	.74	.68	.07	.57	72.0	225.2	236.8	211.2	222.0	40.1	37.0	S-N
Avg.	88.18	84.32	72.69	86.05	.30	.04	-.16	.73	103.9	216.0	249.0	211.2	243.1	36.8	37.0	
Std Dv	.70	.49	.78	.96	.48	.44	.47	.22	26.9	8.5	42.7	.0	36.5	5.3	.0	
90% CI	.82	.40	.64	.79	.39	.37	.38	.18	22.1	7.0	35.1	.0	30.0	4.4	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-A-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D1	89.16	85.53	73.74	87.33	-.35	-.65	-.43	1.68	115.3	204.0	225.7	211.2	233.7	36.0	41.2	N-S
D2	89.16	84.64	74.73	88.00	.83	.79	-.06	.91	110.5	227.4	242.8	211.2	225.5	43.7	41.2	S-N
Avg.	89.16	85.09	74.24	87.67	.24	.07	-.24	1.29	112.9	215.7	234.3	211.2	229.6	39.8	41.2	
Std Dv	.00	.63	.70	.47	.83	1.02	.26	.54	3.4	16.5	12.1	.0	5.8	5.4	.0	
90% CI	.00	2.81	3.13	2.12	3.73	4.55	1.17	2.43	15.2	73.9	54.0	.0	25.9	24.3	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D5	86.20	82.89	72.11	85.38	.35	.34	-.94	.28	116.3	217.3	242.4	211.2	235.7	27.3	32.9	N-S
D6	87.16	83.51	72.19	85.62	.63	.57	.04	.24	109.6	222.4	236.1	211.2	224.2	35.0	32.9	S-N
Avg.	86.68	83.20	72.15	85.50	.49	.45	-.45	.26	112.9	219.9	239.3	211.2	229.9	31.1	32.9	
Std Dv	.68	.44	.06	.17	.20	.16	.69	.03	4.7	3.6	4.5	.0	8.1	5.4	.0	
90% CI	3.03	1.96	.25	.76	.88	.73	3.09	.13	21.2	16.1	19.9	.0	36.3	24.3	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D7	87.26	83.48	71.26	85.38	-.07	-.53	.29	.07	116.9	208.3	233.5	211.2	236.8	30.3	28.8	N-S
D8	87.63	83.78	71.78	85.60	.91	.84	-.02	.14	121.2	227.4	265.7	211.2	246.8	30.9	28.8	S-N
Avg.	87.44	83.63	71.52	85.49	.42	.16	.14	.11	119.1	217.9	249.6	211.2	241.8	30.6	28.8	
Std Dv	.26	.21	.37	.16	.69	.97	.22	.05	3.0	13.5	22.8	.0	7.1	.4	.0	
90% CI	1.17	.95	1.64	.69	3.09	4.33	.98	.22	13.6	60.3	101.7	.0	31.6	1.9	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D9	86.50	83.03	71.66	84.66	.55	.44	-1.08	-.15	118.8	220.1	251.2	211.2	241.1	20.1	24.7	N-S
D10	87.73	83.84	70.93	84.69	1.16	.91	-.07	.19	105.5	232.6	241.5	211.2	219.2	26.7	24.7	S-N
Avg.	87.12	83.43	71.29	84.68	.86	.68	-.57	.02	112.2	226.4	246.4	211.2	230.1	23.4	24.7	
Std Dv	.87	.57	.52	.02	.43	.33	.71	.24	9.4	8.8	6.9	.0	15.5	4.7	.0	
90% CI	3.88	2.56	2.30	.09	1.93	1.48	3.19	1.07	42.0	39.5	30.6	.0	69.1	20.8	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-A-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	---
APPROACH -- TARGET IAS 40.8 kts																
B1	88.04	84.58	72.61	85.98	.46	.16	-.96	.00	107.4	197.8	207.3	191.0	200.2	17.5	21.1	N-S
B2	88.31	83.68	72.09	85.72	-.07	-1.43	-.63	.00	126.1	188.4	233.1	191.0	236.3	18.0	21.1	N-S
B3	87.24	84.34	71.72	85.83	-.01	-.19	-.29	.00	127.3	189.3	238.0	191.0	240.1	19.5	21.1	N-S
B4	87.59	84.41	71.98	84.79	-.07	-.29	-.27	.00	93.9	188.4	188.8	191.0	191.4	19.5	21.1	N-S
B5	87.91	84.61	72.46	85.90	.02	-.12	-.28	.00	120.4	188.7	218.9	191.0	221.5	19.5	21.1	N-S
B6	88.10	83.46	70.87	85.23	-.07	-1.63	-.14	.00	133.2	187.4	257.3	191.0	262.1	20.1	21.1	N-S
Avg.	87.86	84.18	71.95	85.58	.04	-.58	-.43	.00	118.0	190.0	223.9	191.0	225.3	19.0	21.1	
Std Dv	.39	.49	.62	.47	.21	.75	.31	.00	14.7	3.9	24.2	.0	26.4	1.0	.0	
90% CI	.32	.40	.51	.38	.17	.62	.25	.00	12.1	3.2	19.9	.0	21.7	.8	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C1	93.21	89.18	78.01	92.76	.70	.54	-.71	.00	143.2	190.9	319.1	185.5	309.9	18.0	20.6	N-S
C5	92.81	89.00	76.46	90.33	.84	.50	-.34	.00	150.6	190.4	387.8	185.5	377.7	19.5	20.6	N-S
C6	93.23	89.39	77.27	91.98	.42	.28	-.46	.00	146.5	185.3	335.4	185.5	335.6	18.5	20.6	N-S
C7	94.78	90.77	79.36	93.31	1.34	.99	-.63	.00	151.7	198.1	417.9	185.5	391.3	19.0	20.6	N-S
C8	93.26	89.57	76.08	89.74	.26	.22	-.31	.00	152.2	184.3	394.8	185.5	397.2	19.0	20.6	N-S
C9	92.57	88.89	76.19	90.19	.32	.28	-.71	.00	151.6	185.3	389.6	185.5	389.9	17.5	20.6	N-S
Avg.	93.31	89.47	77.23	91.39	.65	.47	-.53	.00	149.3	189.0	374.1	185.5	366.9	18.6	20.6	
Std Dv	.77	.69	1.28	1.50	.41	.29	.18	.00	3.6	5.3	38.2	.0	35.7	.7	.0	
90% CI	.63	.56	1.05	1.23	.33	.24	.15	.00	3.0	4.3	31.4	.0	29.4	.6	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	88.91	85.28	74.31	87.79	.09	.10	-.54	.57	117.2	212.5	239.0	211.2	237.5	32.9	37.0	N-S
A2	89.16	85.93	73.74	87.11	-.17	-.16	.75	.88	125.5	207.3	254.7	211.2	259.5	43.2	37.0	S-N
A3	88.92	85.30	73.82	87.22	.49	.43	-.96	.67	100.3	219.9	223.5	211.2	214.7	30.9	37.0	N-S
A4	89.25	85.93	73.21	86.64	-.16	-.14	.53	.76	102.2	207.7	212.5	211.2	216.1	41.2	37.0	S-N
A5	88.37	84.66	73.84	87.40	.55	.49	-.78	.57	73.9	221.0	230.0	211.2	219.8	32.4	37.0	N-S
A6	89.88	86.54	73.97	87.86	.17	.10	.33	.88	116.9	212.3	238.0	211.2	236.8	40.1	37.0	S-N
Avg.	89.08	85.61	73.81	87.33	.16	.14	-.11	.72	106.0	213.4	232.9	211.2	230.7	36.8	37.0	
Std Dv	.50	.66	.36	.45	.31	.28	.73	.14	18.4	5.9	14.5	.0	17.3	5.3	.0	
90% CI	.41	.54	.29	.37	.25	.23	.60	.12	15.2	4.8	11.9	.0	14.3	4.4	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation
Volpe Center
Acoustics Facility

TABLE B-A-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D1	90.32	86.58	76.11	89.69	.92	.79	-.89	.91	112.7	226.9	245.9	211.2	228.9	36.0	41.2	N-S
D2	91.25	87.80	75.02	89.72	.21	.08	.24	1.68	134.6	212.4	298.4	211.2	296.8	43.7	41.2	S-N
Avg.	90.79	87.19	75.57	89.71	.56	.44	-.32	1.29	123.7	219.6	272.1	211.2	262.8	39.8	41.2	
Std Dv	.66	.86	.77	.02	.50	.50	.80	.54	15.5	10.3	37.1	.0	48.0	5.4	.0	
90% CI	2.94	3.85	3.44	.09	2.24	2.24	3.57	2.43	69.1	45.8	165.7	.0	214.4	24.3	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D5	88.19	84.30	74.16	87.94	.63	.34	-1.05	.24	100.4	222.7	226.4	211.2	214.7	27.3	32.9	N-S
D6	88.16	84.89	73.68	87.65	.10	.08	.25	.28	106.6	211.9	221.1	211.2	220.4	35.0	32.9	S-N
Avg.	88.17	84.60	73.92	87.79	.37	.21	-.40	.26	103.5	217.3	223.8	211.2	217.5	31.1	32.9	
Std Dv	.02	.42	.34	.21	.37	.18	.92	.03	4.4	7.6	3.7	.0	4.0	5.4	.0	
90% CI	.09	1.86	1.52	.92	1.67	.82	4.10	.13	19.6	34.1	16.7	.0	18.0	24.3	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D7	88.93	85.45	73.49	87.03	.87	.80	-.08	.28	104.9	226.8	234.6	211.2	218.5	30.3	28.8	N-S
D8	88.97	85.43	73.48	87.31	.31	.29	.22	.07	125.4	215.0	263.9	211.2	259.2	30.9	28.8	S-N
Avg.	88.95	85.44	73.49	87.17	.59	.55	.07	.17	115.2	220.9	249.3	211.2	238.9	30.6	28.8	
Std Dv	.03	.01	.01	.20	.40	.36	.21	.15	14.5	8.3	20.7	.0	28.8	.4	.0	
90% CI	.13	.06	.03	.88	1.77	1.61	.95	.66	64.7	37.3	92.5	.0	128.5	1.9	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D9	87.99	84.44	73.11	86.55	.28	.25	-.98	.14	96.0	215.0	216.2	211.2	212.4	20.1	24.7	N-S
D10	89.04	85.50	73.88	87.46	-.16	-.16	.45	-.27	114.2	206.4	226.3	211.2	231.6	26.7	24.7	S-N
Avg.	88.51	84.97	73.49	87.01	.06	.05	-.26	-.07	105.1	210.7	221.3	211.2	222.0	23.4	24.7	
Std Dv	.74	.75	.54	.64	.31	.29	1.01	.29	12.9	6.1	7.1	.0	13.6	4.7	.0	
90% CI	3.31	3.35	2.43	2.87	1.39	1.29	4.51	1.29	57.5	27.2	31.9	.0	60.6	20.8	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-B-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B15	90.52	87.28	79.23	92.15	-.21	-.24	-1.60	.00	86.1	112.8	113.0	118.2	117.2	13.9	21.1	N-S
B16	90.71	85.94	75.78	90.11	-.09	-2.17	-2.17	.00	132.0	114.0	153.6	118.2	157.4	12.3	21.1	N-S
B17	89.64	84.80	73.92	89.30	.33	-.93	-1.99	.00	120.1	118.6	137.1	118.2	136.7	13.4	21.1	N-S
B18	89.04	85.10	73.97	89.17	.08	-.23	-2.06	.00	111.0	115.8	124.0	118.2	126.6	12.9	21.1	N-S
B19	89.89	85.80	76.75	90.25	.40	-.21	-2.10	.00	92.6	121.5	121.6	118.2	118.3	13.4	21.1	N-S
B20	88.66	84.65	75.02	89.92	.09	.05	-1.78	.00	118.6	117.4	133.7	118.2	134.7	13.9	21.1	N-S
Avg.	89.74	85.60	75.78	90.15	.10	-.62	-1.95	.00	110.1	116.7	130.5	118.2	131.8	13.3	21.1	
Std Dv	.80	.98	2.01	1.07	.23	.83	.22	.00	17.5	3.2	14.2	.0	14.9	.6	.0	
90% CI	.66	.80	1.65	.88	.19	.68	.18	.00	14.4	2.6	11.7	.0	12.3	.5	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C21	89.29	84.64	73.89	89.20	3.44	3.29	-3.75	.00	123.3	148.9	178.2	109.1	130.6	11.8	20.6	N-S
C23	88.50	83.98	74.67	89.08	2.62	2.37	-3.28	.00	135.3	133.7	190.2	109.1	155.1	11.8	20.6	N-S
C24	88.47	84.02	73.92	88.77	1.43	1.34	-3.12	.00	123.2	123.0	146.9	109.1	130.4	11.3	20.6	N-S
C26	88.17	83.57	73.42	88.38	.74	.69	-2.82	.00	128.5	114.8	146.7	109.1	139.4	11.3	20.6	N-S
C27	89.48	84.63	74.02	89.32	.93	.76	-2.35	.00	122.7	117.3	139.4	109.1	129.7	12.9	20.6	N-S
C28	88.13	83.75	74.11	88.64	.98	.94	-2.56	.00	124.8	117.9	143.6	109.1	132.8	12.3	20.6	N-S
Avg.	88.67	84.10	74.00	88.90	1.69	1.56	-2.98	.00	126.3	125.9	157.5	109.1	136.3	11.9	20.6	
Std Dv	.57	.45	.40	.36	1.09	1.05	.51	.00	4.9	13.1	21.2	.0	9.9	.6	.0	
90% CI	.47	.37	.33	.30	.90	.86	.42	.00	4.0	10.8	17.4	.0	8.1	.5	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	85.55	81.61	71.79	87.12	1.76	1.70	-1.34	1.50	118.2	171.6	194.7	148.8	168.7	31.4	37.0	N-S
A2	85.72	81.68	71.36	86.21	.73	.70	.26	1.40	124.5	155.8	189.1	148.8	180.6	41.2	37.0	S-N
A3	85.48	81.41	71.48	86.53	.44	.41	-1.03	1.34	122.3	151.8	179.6	148.8	176.0	29.8	37.0	N-S
A4	85.54	81.44	71.15	86.53	.74	.69	.05	1.40	140.8	155.0	245.1	148.8	235.2	39.1	37.0	S-N
A5	85.53	80.90	71.08	86.56	1.14	.89	-1.25	1.46	143.1	159.7	265.7	148.8	247.4	29.8	37.0	N-S
A6	86.20	81.93	71.79	86.58	1.08	1.05	.23	1.50	143.6	158.8	267.3	148.8	250.4	41.7	37.0	S-N
Avg.	85.67	81.50	71.44	86.59	.98	.91	-.51	1.43	132.1	158.8	223.6	148.8	209.7	35.5	37.0	
Std Dv	.27	.35	.31	.29	.46	.44	.77	.06	11.6	6.9	40.3	.0	38.4	5.8	.0	
90% CI	.22	.29	.25	.24	.38	.37	.63	.05	9.6	5.7	33.1	.0	31.6	4.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-B-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D7	87.57	83.10	72.59	87.85	1.05	.98	-.91	2.87	116.3	160.7	179.3	148.8	166.0	36.0	41.2	N-S
D8	88.40	83.98	72.64	88.00	.43	.36	.34	2.89	107.1	151.1	158.0	148.8	155.6	45.3	41.2	S-N
Avg.	87.96	83.54	72.61	87.93	.74	.67	-.28	2.88	111.7	155.9	168.6	148.8	160.8	40.7	41.2	
Std Dv	.57	.62	.04	.11	.44	.44	.88	.01	6.5	6.8	15.1	.0	7.4	6.6	.0	
90% CI	2.56	2.78	.16	.47	1.96	1.96	3.95	.06	29.0	30.3	67.2	.0	32.8	29.4	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D9	85.20	80.65	71.78	86.95	.83	.80	-1.16	.52	116.7	157.9	176.7	148.8	166.4	26.7	32.9	N-S
D10	85.41	81.28	70.81	86.44	.39	.29	.89	.47	112.8	151.4	164.3	148.8	161.4	41.2	32.9	S-N
Avg.	85.31	80.96	71.29	86.69	.61	.55	-.13	.50	114.8	154.6	170.5	148.8	163.9	34.0	32.9	
Std Dv	.15	.45	.69	.36	.31	.36	1.45	.04	2.8	4.6	8.8	.0	3.5	10.3	.0	
90% CI	.66	1.99	3.06	1.61	1.39	1.61	6.47	.16	12.3	20.5	39.1	.0	15.8	45.8	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D11	84.42	80.03	70.85	86.00	.92	.84	-1.33	-.36	121.0	158.8	185.2	148.8	173.5	22.6	28.8	N-S
D12	84.42	80.23	70.90	85.70	.61	.55	.80	-.49	98.9	154.8	156.7	148.8	150.6	36.0	28.8	S-N
Avg.	84.42	80.13	70.88	85.85	.76	.69	-.26	-.43	109.9	156.8	170.9	148.8	162.1	29.3	28.8	
Std Dv	.00	.14	.04	.21	.22	.21	1.51	.09	15.6	2.8	20.2	.0	16.2	9.5	.0	
90% CI	.00	.63	.16	.95	.98	.92	6.72	.41	69.8	12.6	90.0	.0	72.3	42.3	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D13	84.92	80.39	71.74	86.91	.57	.53	-1.79	-1.08	111.6	154.4	166.1	148.8	160.0	17.0	24.7	N-S
D14	84.40	80.07	70.54	85.93	.03	.02	1.11	-1.08	114.1	146.5	160.4	148.8	162.9	31.4	24.7	S-N
Avg.	84.66	80.23	71.14	86.42	.30	.27	-.34	-1.08	112.8	150.4	163.3	148.8	161.4	24.2	24.7	
Std Dv	.37	.23	.85	.69	.38	.36	2.05	.00	1.8	5.6	4.0	.0	2.1	10.2	.0	
90% CI	1.64	1.01	3.79	3.09	1.70	1.61	9.16	.00	7.9	24.9	18.0	.0	9.2	45.5	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation
Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-B-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B15	84.96	82.41	70.14	82.34	.23	-.11	-1.82	.00	75.2	191.5	198.1	191.0	197.5	13.9	21.1	N-S
B16	85.45	83.51	74.42	85.56	.44	.34	-2.39	.00	43.7	193.7	280.3	191.0	276.3	12.3	21.1	N-S
B17	83.84	81.64	73.29	84.35	.41	.33	-2.05	.00	53.4	194.0	241.5	191.0	237.7	13.4	21.1	N-S
B18	83.96	81.18	71.66	83.55	.46	.20	-2.13	.00	39.9	190.2	296.3	191.0	297.5	12.9	21.1	N-S
B19	85.26	80.01	68.74	83.21	1.15	-1.19	-2.16	.00	130.3	198.8	260.6	191.0	250.2	13.4	21.1	N-S
B20	84.30	81.21	70.17	82.79	.59	.31	-1.85	.00	118.0	192.8	218.4	191.0	216.3	13.9	21.1	N-S
Avg.	84.63	81.66	71.40	83.63	.55	-.02	-2.07	.00	76.8	193.5	249.2	191.0	245.9	13.3	21.1	
Std Dv	.69	1.20	2.14	1.17	.32	.60	.21	.00	38.9	3.0	37.2	.0	37.1	.6	.0	
90% CI	.57	.98	1.76	.96	.26	.49	.17	.00	32.0	2.4	30.6	.0	30.5	.5	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C21	85.80	82.18	70.84	84.29	2.12	1.88	-3.08	.00	91.7	216.9	217.0	185.5	185.5	11.8	20.6	N-S
C23	84.73	80.90	69.35	82.71	1.27	1.17	-2.82	.00	85.6	204.1	204.7	185.5	186.0	11.8	20.6	N-S
C24	85.16	81.34	69.16	83.31	.97	.74	-2.87	.00	124.4	197.2	238.9	185.5	224.6	11.3	20.6	N-S
C26	85.73	81.55	70.63	84.07	.71	.55	-2.73	.00	99.5	191.3	194.0	185.5	188.0	11.3	20.6	N-S
C27	85.96	81.89	70.32	85.08	.77	.65	-2.22	.00	115.5	193.5	214.3	185.5	205.4	12.9	20.6	N-S
C28	85.62	81.47	69.48	83.11	.78	.59	-2.44	.00	103.9	195.0	201.0	185.5	191.1	12.3	20.6	N-S
Avg.	85.50	81.56	69.96	83.76	1.10	.93	-2.69	.00	103.4	199.7	211.7	185.5	196.8	11.9	20.6	
Std Dv	.46	.44	.72	.88	.54	.52	.31	.00	14.5	9.5	15.8	.0	15.5	.6	.0	
90% CI	.38	.37	.59	.72	.44	.43	.26	.00	12.0	7.8	13.0	.0	12.7	.5	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	84.26	80.56	69.47	82.66	1.23	.45	-1.02	1.68	120.4	226.3	262.5	211.2	245.0	31.4	37.0	N-S
A2	83.62	79.11	67.15	81.82	.87	-.54	.22	.48	64.8	223.3	246.9	211.2	233.5	41.2	37.0	S-N
A3	83.87	80.96	70.25	82.36	.43	.32	-.98	1.62	109.9	213.2	226.8	211.2	224.7	29.8	37.0	N-S
A4	83.13	78.77	67.07	81.53	.69	-.79	.04	.48	63.7	220.5	246.0	211.2	235.7	39.1	37.0	S-N
A5	83.76	80.57	69.16	81.77	.79	.33	-1.09	1.69	115.8	218.5	242.6	211.2	234.5	29.8	37.0	N-S
A6	83.14	79.41	68.18	82.79	1.04	.34	.24	.39	57.2	224.6	267.2	211.2	251.3	41.7	37.0	S-N
Avg.	83.63	79.90	68.55	82.15	.84	.02	-.43	1.06	88.6	221.1	248.7	211.2	237.5	35.5	37.0	
Std Dv	.44	.91	1.30	.52	.28	.54	.66	.67	29.6	4.8	14.6	.0	9.4	5.8	.0	
90% CI	.36	.75	1.07	.43	.23	.44	.54	.55	24.3	3.9	12.0	.0	7.7	4.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

TABLE B-B-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D7	86.21	83.58	70.73	83.19	.87	.75	-.81	3.00	112.3	222.5	240.4	211.2	228.2	36.0	41.2	N-S
D8	84.44	81.78	71.12	83.45	.70	.56	.27	.43	82.4	217.9	219.9	211.2	213.1	45.3	41.2	S-N
Avg.	85.33	82.68	70.93	83.32	.78	.65	-.27	1.72	97.4	220.2	230.1	211.2	220.6	40.7	41.2	
Std Dv	1.25	1.27	.28	.18	.12	.13	.76	1.82	21.1	3.3	14.5	.0	10.7	6.6	.0	
90% CI	5.59	5.68	1.23	.82	.54	.60	3.41	8.11	94.4	14.5	64.7	.0	47.7	29.4	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D9	83.21	79.17	68.11	81.73	1.16	-.06	-1.15	.73	134.0	223.7	311.0	211.2	293.6	26.7	32.9	N-S
D10	83.60	79.27	67.64	82.66	.69	-.37	.81	.38	63.3	219.0	245.2	211.2	236.4	41.2	32.9	S-N
Avg.	83.40	79.22	67.88	82.20	.92	-.22	-.17	.56	98.7	221.4	278.1	211.2	265.0	34.0	32.9	
Std Dv	.28	.07	.33	.66	.33	.22	1.39	.25	50.0	3.3	46.5	.0	40.4	10.3	.0	
90% CI	1.23	.32	1.48	2.94	1.48	.98	6.19	1.10	223.2	14.8	207.7	.0	180.6	45.8	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D11	81.87	78.88	68.12	80.73	.83	.68	-1.23	-.09	112.7	220.3	238.8	211.2	228.9	22.6	28.8	N-S
D12	83.45	79.37	66.27	80.70	.77	-.24	.75	.42	63.3	222.2	248.7	211.2	236.4	36.0	28.8	S-N
Avg.	82.66	79.13	67.19	80.71	.80	.22	-.24	.16	88.0	221.3	243.8	211.2	232.6	29.3	28.8	
Std Dv	1.12	.35	1.31	.02	.04	.65	1.40	.36	34.9	1.3	7.0	.0	5.3	9.5	.0	
90% CI	4.99	1.55	5.84	.09	.19	2.90	6.25	1.61	156.0	6.0	31.3	.0	23.7	42.3	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D13	82.41	79.32	68.82	81.38	.88	.66	-1.80	-.76	108.8	219.8	232.3	211.2	223.2	17.0	24.7	N-S
D14	83.68	80.05	68.04	81.24	.73	.49	.97	.40	124.9	214.8	262.1	211.2	257.7	31.4	24.7	S-N
Avg.	83.04	79.68	68.43	81.31	.81	.58	-.41	-.18	116.9	217.3	247.2	211.2	240.5	24.2	24.7	
Std Dv	.90	.52	.55	.10	.11	.12	1.96	.82	11.4	3.5	21.1	.0	24.4	10.2	.0	
90% CI	4.01	2.30	2.46	.44	.47	.54	8.74	3.66	50.8	15.8	94.1	.0	108.9	45.5	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

TABLE B-B-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B15	84.55	82.07	71.33	82.88	-.10	-.15	-1.68	.00	74.8	185.2	191.9	191.0	197.9	13.9	21.1	N-S
B16	85.42	82.86	72.34	84.19	-.15	-.19	-2.18	.00	93.7	184.5	184.9	191.0	191.4	12.3	21.1	N-S
B17	84.75	81.85	70.28	82.81	.07	.01	-1.92	.00	55.4	188.3	228.6	191.0	231.9	13.4	21.1	N-S
B18	84.83	81.89	69.70	82.27	.17	-.04	-2.10	.00	39.7	188.7	295.2	191.0	298.7	12.9	21.1	N-S
B19	84.27	81.30	69.84	82.19	.00	-.04	-1.89	.00	90.9	187.0	187.0	191.0	191.0	13.4	21.1	N-S
B20	84.33	81.07	70.62	83.11	.18	-.02	-1.74	.00	91.8	188.0	188.1	191.0	191.1	13.9	21.1	N-S
Avg.	84.69	81.84	70.68	82.91	.03	-.07	-1.92	.00	74.4	186.9	212.6	191.0	217.0	13.3	21.1	
Std Dv	.42	.63	1.00	.72	.14	.08	.20	.00	22.4	1.7	43.7	.0	43.0	.6	.0	
90% CI	.35	.52	.82	.60	.11	.07	.16	.00	18.4	1.4	35.9	.0	35.4	.5	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C21	87.47	82.97	70.43	84.85	1.86	.56	-2.85	.00	127.1	205.6	257.7	185.5	232.4	11.8	20.6	N-S
C23	86.28	83.01	71.49	85.48	.89	1.01	-2.68	.00	131.5	197.7	263.9	185.5	247.5	11.8	20.6	N-S
C24	86.53	82.57	70.33	84.56	.75	.24	-2.72	.00	125.3	190.6	233.6	185.5	227.2	11.3	20.6	N-S
C26	86.55	82.74	71.61	85.53	.42	.28	-2.62	.00	89.3	186.4	186.5	185.5	185.5	11.3	20.6	N-S
C27	88.05	84.19	73.91	88.74	.54	.39	-2.08	.00	106.0	187.2	194.8	185.5	192.9	12.9	20.6	N-S
C28	86.16	82.58	71.21	85.05	.39	.27	-2.24	.00	81.9	186.4	188.3	185.5	187.3	12.3	20.6	N-S
Avg.	86.84	83.01	71.50	85.70	.81	.46	-2.53	.00	110.2	192.3	220.8	185.5	212.1	11.9	20.6	
Std Dv	.75	.61	1.30	1.53	.55	.29	.30	.00	21.1	7.8	35.5	.0	26.8	.6	.0	
90% CI	.62	.50	1.07	1.26	.45	.24	.25	.00	17.3	6.4	29.2	.0	22.0	.5	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	83.27	80.11	69.91	83.24	1.28	1.05	-1.08	.36	100.3	229.5	233.3	211.2	214.7	31.4	37.0	N-S
A2	84.48	81.26	69.42	82.52	.23	-.36	.51	1.66	120.2	208.9	241.8	211.2	244.5	41.2	37.0	S-N
A3	82.65	79.67	69.30	82.07	.46	.20	-.99	.51	106.3	213.6	222.5	211.2	220.0	29.8	37.0	N-S
A4	84.28	81.44	70.19	83.10	.29	.22	.24	1.66	103.4	210.7	216.7	211.2	217.1	39.1	37.0	S-N
A5	82.74	79.72	69.58	82.06	.85	.71	-1.13	.43	71.8	220.8	232.4	211.2	222.3	29.8	37.0	N-S
A6	84.00	81.20	69.83	83.07	.44	.21	.49	1.69	107.8	212.0	222.7	211.2	221.9	41.7	37.0	S-N
Avg.	83.57	80.57	69.71	82.68	.59	.34	-.33	1.05	101.6	215.9	228.2	211.2	223.4	35.5	37.0	
Std Dv	.79	.82	.33	.53	.40	.49	.82	.68	16.1	7.8	9.2	.0	10.7	5.8	.0	
90% CI	.65	.68	.27	.44	.33	.40	.67	.56	13.3	6.4	7.6	.0	8.8	4.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-B-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

	CORRECTED (dB)				C 'ECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D7	84.13	81.18	70.07	82.85	.96	.74	-.70	.39	146.5	217.1	392.9	211.2	382.3	36.0	41.2	N-S
D8	86.48	83.55	70.87	84.36	.64	.43	.48	3.04	156.4	207.6	519.0	211.2	527.9	45.3	41.2	S-N
Avg.	85.31	82.37	70.47	83.60	.80	.59	-.11	1.71	151.4	212.4	456.0	211.2	455.1	40.7	41.2	
Std Dv	1.66	1.68	.57	1.07	.23	.22	.83	1.87	7.0	6.7	89.2	.0	103.0	6.6	.0	
90% CI	7.42	7.48	2.53	4.77	1.01	.98	3.73	8.37	31.3	30.0	398.1	.0	459.7	29.4	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D9	83.08	80.04	70.00	83.05	1.21	.93	-1.00	.34	155.2	216.3	515.2	211.2	503.2	26.7	32.9	N-S
D10	84.19	81.18	70.30	82.41	.52	.30	1.06	.70	155.6	207.0	501.4	211.2	511.6	41.2	32.9	S-N
Avg.	83.63	80.61	70.15	82.73	.87	.62	.03	.52	155.4	211.6	508.3	211.2	507.4	34.0	32.9	
Std Dv	.78	.81	.21	.45	.49	.45	1.46	.25	.3	6.6	9.8	.0	5.9	10.3	.0	
90% CI	3.50	3.60	.95	2.02	2.18	1.99	6.50	1.14	1.3	29.4	43.6	.0	26.5	45.8	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D11	83.77	80.28	69.72	82.98	1.29	.86	-1.16	.38	157.1	216.5	556.4	211.2	542.7	22.6	28.8	N-S
D12	82.39	79.28	67.83	81.46	.54	.18	1.02	-.18	149.8	208.7	414.3	211.2	419.4	36.0	28.8	S-N
Avg.	83.08	79.78	68.78	82.22	.91	.52	-.07	.10	153.5	212.6	485.4	211.2	481.0	29.3	28.8	
Std Dv	.98	.71	1.34	1.07	.53	.48	1.54	.40	5.2	5.5	100.5	.0	87.2	9.5	.0	
90% CI	4.32	3.16	5.97	4.80	2.37	2.15	6.88	1.77	23.0	24.6	448.6	.0	389.3	42.3	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D13	83.40	81.04	68.70	81.21	.54	.38	-1.61	.40	147.5	210.5	391.8	211.2	393.1	17.0	24.7	N-S
D14	82.13	79.11	70.12	83.13	.21	.07	1.18	-.76	152.1	204.3	436.4	211.2	451.1	31.4	24.7	S-N
Avg.	83.21	80.07	69.41	82.17	.38	.22	-.22	-.18	149.8	207.4	414.1	211.2	422.1	24.2	24.7	
Std Dv	1.53	1.36	1.00	1.36	.23	.22	1.97	.82	3.3	4.4	31.5	.0	41.0	10.2	.0	
90% CI	6.85	6.09	4.48	6.06	1.04	.98	8.81	3.66	14.5	19.6	140.8	.0	183.1	45.5	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-C-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR
(25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTM	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B18	93.44	91.68	82.45	94.51	-.15	-.14	1.18	.00	70.0	116.7	124.2	118.2	125.8	27.3	21.1	N-S
B20	92.64	90.84	81.64	93.96	-.64	-.59	1.22	.00	73.9	111.0	115.6	118.2	123.1	26.2	21.1	N-S
B21	92.61	89.89	80.07	92.57	-.27	-1.15	1.14	.00	97.5	115.3	116.2	118.2	119.2	26.7	21.1	N-S
B22	91.54	89.77	81.60	92.99	-.33	-.36	1.28	.00	79.9	114.0	115.8	118.2	120.1	27.3	21.1	N-S
B23	91.82	89.09	79.22	91.65	-.62	-1.46	1.54	.00	124.7	111.3	135.4	118.2	143.9	28.3	21.1	N-S
B24	92.40	90.54	80.52	92.64	-.59	-.73	1.60	.00	82.6	111.6	112.5	118.2	119.2	28.8	21.1	N-S
Avg.	92.41	90.30	80.92	93.05	-.43	-.74	1.33	.00	88.1	113.3	119.9	118.2	125.2	27.4	21.1	
Std Dv	.67	.91	1.19	1.03	.21	.49	.20	.00	20.3	2.4	8.5	.0	9.5	1.0	.0	
90% CI	.55	.75	.98	.85	.17	.41	.16	.00	16.7	2.0	7.0	.0	7.8	.8	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C25	88.54	84.42	74.23	88.96	.24	.25	1.49	.00	135.6	112.3	160.5	109.1	156.0	29.8	20.6	N-S
C26	89.57	85.33	74.72	89.65	1.04	.99	1.18	.00	133.6	120.5	166.4	109.1	150.6	29.8	20.6	N-S
C27	88.38	84.36	73.44	88.03	-.13	-.10	.82	.00	126.7	108.3	135.0	109.1	136.0	24.7	20.6	N-S
C28	88.67	84.54	74.71	89.79	-.89	-.80	1.62	.00	135.5	101.4	144.6	109.1	155.5	27.8	20.6	N-S
C29	88.50	84.28	74.05	88.73	.27	.27	1.02	.00	141.4	112.1	179.9	109.1	175.0	26.7	20.6	N-S
C30	87.92	83.97	73.23	87.75	-1.46	-1.39	1.57	.00	128.0	95.1	120.7	109.1	138.5	25.7	20.6	N-S
Avg.	88.60	84.48	74.06	88.82	-.16	-.13	1.28	.00	133.5	108.3	151.2	109.1	151.9	27.4	20.6	
Std Dv	.54	.46	.63	.83	.90	.85	.33	.00	5.4	9.0	21.8	.0	14.1	2.1	.0	
90% CI	.45	.38	.52	.68	.74	.70	.27	.00	4.5	7.4	17.9	.0	11.6	1.7	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	82.28	78.46	70.12	84.95	.93	.89	.09	-.38	105.6	163.7	169.9	148.8	154.4	41.7	37.0	N-S
A2	82.65	78.57	70.73	85.57	.90	.85	-.97	-.53	106.3	162.8	169.6	148.8	155.0	32.4	37.0	S-N
A3	82.59	78.55	70.25	84.93	1.19	1.13	-.01	-.19	98.3	167.7	169.5	148.8	150.3	41.7	37.0	N-S
A4	82.66	78.84	70.74	85.71	.51	.50	-.83	-.19	98.5	157.4	159.2	148.8	150.4	32.4	37.0	S-N
A5	82.66	79.01	70.61	84.90	.75	.72	.43	-.19	115.3	161.0	178.1	148.8	164.6	44.2	37.0	N-S
A7	83.19	79.20	71.24	86.18	.55	.44	-.87	-.19	105.8	156.5	162.6	148.8	154.6	31.9	37.0	S-N
Avg.	82.67	78.77	70.61	85.37	.81	.76	-.36	-.28	105.0	161.5	168.2	148.8	154.9	37.4	37.0	
Std Dv	.29	.26	.40	.53	.26	.26	.60	.14	6.3	4.2	6.6	.0	5.2	5.7	.0	
90% CI	.24	.24	.33	.44	.21	.21	.49	.12	5.1	3.4	5.4	.0	4.3	4.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR
(25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D8	83.89	79.51	72.09	86.93	1.32	1.14	-.19	.15	121.1	167.0	195.1	148.8	173.7	44.2	41.2	N-S
D9	83.97	79.80	72.68	87.61	.51	.41	-.48	.15	106.1	155.9	162.2	148.8	154.8	38.6	41.2	S-N
Avg.	83.93	79.65	72.38	87.27	.92	.77	-.34	.15	113.6	161.4	178.6	148.8	164.3	41.4	41.2	
Std Dv	.06	.21	.42	.48	.57	.52	.21	.00	10.6	7.8	23.3	.0	13.4	4.0	.0	
90% CI	.25	.92	1.86	2.15	2.56	2.30	.92	.00	47.4	35.0	103.9	.0	59.7	17.7	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D10	82.64	77.86	69.57	84.72	1.04	.28	.09	-.34	102.7	163.7	167.8	148.8	152.5	37.0	32.9	N-S
D11	82.93	78.89	70.00	84.85	.95	.82	-1.04	-.19	102.2	162.4	166.1	148.8	152.2	28.3	32.9	S-N
Avg.	82.79	78.38	69.79	84.79	1.00	.55	-.47	-.26	102.4	163.0	167.0	148.8	152.4	32.7	32.9	
Std Dv	.21	.73	.30	.09	.06	.38	.80	.11	.4	.9	1.2	.0	.2	6.2	.0	
90% CI	.92	3.25	1.36	.41	.28	1.70	3.57	.47	1.6	4.1	5.4	.0	.9	27.5	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D12	83.29	79.19	69.47	84.25	1.21	1.05	.36	.05	101.6	166.1	169.6	148.8	151.8	35.0	28.8	N-S
D13	83.81	79.71	70.49	85.10	1.28	1.12	-1.00	.05	106.8	167.2	174.6	148.8	155.4	25.7	28.8	S-N
Avg.	83.55	79.45	69.98	84.68	1.25	1.09	-.32	.05	104.2	166.6	172.1	148.8	153.6	30.4	28.8	
Std Dv	.37	.37	.72	.60	.05	.05	.96	.00	3.7	.8	3.5	.0	2.5	6.6	.0	
90% CI	1.64	1.64	3.22	2.68	.22	.22	4.29	.00	16.4	3.5	15.8	.0	11.4	29.4	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D14	83.96	79.99	70.24	84.69	1.20	1.05	.27	.38	118.2	166.1	188.5	148.8	168.8	29.3	24.7	N-S
D16	84.27	80.26	70.43	85.39	.97	.93	-1.33	.25	95.4	164.1	164.8	148.8	149.4	20.1	24.7	S-N
Avg.	84.11	80.13	70.33	85.04	1.09	.99	-.53	.31	106.8	165.1	176.6	148.8	159.1	24.7	24.7	
Std Dv	.22	.19	.13	.49	.16	.08	1.13	.09	16.1	1.4	16.8	.0	13.7	6.5	.0	
90% CI	.98	.85	.60	2.21	.73	.38	5.05	.41	72.0	6.3	74.8	.0	61.2	29.0	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-C-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B18	87.41	85.45	75.57	87.20	.02	.03	1.09	.00	68.4	192.4	207.0	191.0	205.4	27.3	21.1	N-S
B20	88.17	86.49	78.21	90.17	-.16	-.12	.98	.00	57.8	189.7	224.2	191.0	225.7	26.2	21.1	N-S
B21	86.86	84.75	74.92	86.78	-.01	.02	1.00	.00	59.2	192.3	223.8	191.0	222.3	26.7	21.1	N-S
B22	88.69	86.44	77.03	89.17	-.14	-.13	1.15	.00	56.6	189.8	227.3	191.0	228.7	27.3	21.1	N-S
B23	87.66	85.30	74.10	85.77	-.21	-.16	1.33	.00	49.8	188.9	247.2	191.0	249.9	28.3	21.1	N-S
B24	88.01	86.16	75.11	86.50	-.15	-.13	1.38	.00	59.8	189.6	219.4	191.0	220.9	28.8	21.1	N-S
Avg.	87.80	85.76	75.82	87.60	-.11	-.08	1.15	.00	58.6	190.4	224.8	191.0	225.5	27.4	21.1	
Std Dv	.64	.70	1.52	1.70	.09	.08	.17	.00	6.0	1.5	13.1	.0	14.4	1.0	.0	
90% CI	.52	.58	1.25	1.40	.08	.07	.14	.00	4.9	1.2	10.8	.0	11.9	.8	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C25	84.98	79.93	67.19	82.35	.35	-.71	1.45	.00	137.5	192.4	284.6	185.5	274.3	29.8	20.6	N-S
C26	85.69	81.76	68.79	83.58	.49	.31	1.41	.00	140.8	194.3	307.6	185.5	293.6	29.8	20.6	N-S
C27	85.17	81.34	69.33	84.05	.15	.14	.72	.00	145.9	188.6	336.7	185.5	331.0	24.7	20.6	N-S
C28	85.22	80.68	68.36	83.09	-.69	-1.38	1.50	.00	139.3	177.0	271.5	185.5	284.5	27.8	20.6	N-S
C29	84.48	79.63	67.16	81.70	.05	-1.06	1.10	.00	135.2	187.2	265.8	185.5	263.2	26.7	20.6	N-S
C30	85.15	81.41	69.20	83.86	-.37	-.31	1.07	.00	135.1	181.1	256.8	185.5	262.9	25.7	20.6	N-S
Avg.	85.11	80.79	68.34	83.11	-.00	-.50	1.21	.00	139.0	186.8	287.2	185.5	284.9	27.4	20.6	
Std Dv	.39	.86	.96	.92	.45	.67	.30	.00	4.1	6.6	30.0	.0	25.6	2.1	.0	
90% CI	.32	.71	.79	.76	.37	.55	.25	.00	3.3	5.5	24.7	.0	21.0	1.7	.0	
150 m FLYOVER -- TARGET IAS 72 kts -- 0.9Vh																
A1	80.63	77.72	68.02	80.67	.50	.49	.27	-.25	109.6	223.2	237.0	211.2	224.2	41.7	37.0	N-S
A2	80.68	77.51	67.97	81.23	.80	.75	-.92	-.36	114.5	228.7	251.2	211.2	232.1	32.4	37.0	S-N
A3	80.66	77.47	67.81	80.99	.53	.46	.28	-.13	109.6	222.7	236.4	211.2	224.2	41.7	37.0	N-S
A4	80.74	77.67	68.72	82.18	.47	.41	-.79	-.14	110.1	221.8	236.1	211.2	224.9	32.4	37.0	S-N
A5	80.86	77.62	67.86	80.97	.23	.20	.65	-.13	117.2	217.1	244.1	211.2	237.5	44.2	37.0	N-S
A7	81.42	78.24	68.20	81.56	.43	.27	-.84	-.14	107.6	220.9	231.7	211.2	221.5	31.9	37.0	S-N
Avg.	80.83	77.70	68.10	81.27	.49	.43	-.22	-.19	111.4	222.4	239.4	211.2	227.4	37.4	37.0	
Std Dv	.30	.28	.33	.54	.18	.19	.70	.09	3.6	3.8	7.0	.0	6.1	5.7	.0	
90% CI	.25	.23	.28	.44	.15	.16	.58	.08	3.0	3.1	5.8	.0	5.0	4.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-C-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D8	82.02	78.06	68.00	82.00	.67	.10	.04	.09	137.0	224.9	330.0	211.2	309.9	44.2	41.2	N-S
D9	83.03	79.19	68.54	82.73	.39	.00	-.46	.09	120.7	220.1	256.0	211.2	245.7	38.6	41.2	S-N
Avg.	82.52	78.63	68.27	82.37	.53	.05	-.21	.09	128.9	222.5	293.0	211.2	277.8	41.4	41.2	
Std Dv	.71	.80	.38	.52	.20	.07	.35	.00	11.5	3.4	52.3	.0	45.4	4.0	.0	
90% CI	3.19	3.57	1.70	2.30	.88	.32	1.58	.00	51.5	15.2	233.6	.0	202.7	17.7	.0	
TAKEOFF -- TARGET IAS 64.0 kts -- 0.8Vh																
D10	80.53	77.13	6.83	80.13	.57	.39	.27	-.28	110.8	223.2	238.8	211.2	225.9	37.0	32.9	N-S
D11	80.67	77.37	67.96	81.39	.82	.80	-1.02	-.20	110.3	229.5	244.7	211.2	225.2	28.3	32.9	S-N
Avg.	80.60	77.25	67.40	80.76	.69	.60	-.38	-.24	110.6	226.4	241.8	211.2	225.5	32.7	32.9	
Std Dv	.10	.17	.80	.89	.18	.29	.91	.06	.4	4.5	4.2	.0	.5	6.2	.0	
90% CI	.44	.76	3.57	3.98	.79	1.29	4.07	.25	1.6	19.9	18.6	.0	2.2	27.5	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D12	81.63	78.22	67.57	80.60	.66	.60	.56	-.10	105.5	225.4	234.0	211.2	219.2	35.0	28.8	N-S
D13	80.29	77.11	66.08	79.55	.83	.76	-.84	-.14	92.0	228.8	228.9	211.2	211.3	25.7	28.8	S-N
Avg.	80.96	77.67	66.82	80.07	.75	.68	-.14	-.12	98.8	227.1	231.4	211.2	215.3	30.4	28.8	
Std Dv	.95	.78	1.05	.74	.12	.11	.99	.03	9.5	2.4	3.6	.0	5.6	6.6	.0	
90% CI	4.23	3.50	4.70	3.31	.54	.51	4.42	.13	42.6	10.7	16.1	.0	24.9	29.4	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D14	81.17	77.77	66.24	79.62	.64	.53	.48	.05	122.1	224.6	265.1	211.2	249.3	29.3	24.7	N-S
D16	81.49	78.20	66.74	80.10	1.01	.92	-1.31	.01	115.4	232.1	257.0	211.2	233.9	20.1	24.7	S-N
Avg.	81.33	77.99	66.49	79.86	.82	.73	-.41	.03	118.8	228.4	261.0	211.2	241.6	24.7	24.7	
Std Dv	.23	.30	.35	.34	.26	.28	1.27	.03	4.7	5.3	5.7	.0	10.9	6.5	.0	
90% CI	1.01	1.36	1.58	1.52	1.17	1.23	5.65	.13	21.2	23.7	25.6	.0	48.6	29.0	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-C-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B18	85.31	82.66	70.52	84.06	-.21	-.38	1.20	.00	115.1	187.6	207.2	191.0	210.9	27.3	21.1	N-S
B20	85.13	82.48	70.34	83.50	-.47	-.42	1.13	.00	82.6	183.4	184.9	191.0	192.6	26.2	21.1	N-S
B21	84.45	81.89	70.11	83.02	-.33	-.30	1.15	.00	97.0	186.0	187.4	191.0	192.4	26.7	21.1	N-S
B22	85.05	82.44	71.09	84.07	-.26	-.24	1.21	.00	94.7	186.9	187.5	191.0	191.6	27.3	21.1	N-S
B23	84.96	82.52	69.65	82.90	-.43	-.48	1.43	.00	132.3	184.5	249.3	191.0	258.0	28.3	21.1	N-S
B24	84.12	81.76	70.40	83.25	-.41	-.36	1.51	.00	88.2	184.2	184.3	191.0	191.1	28.8	21.1	N-S
Avg.	84.84	82.29	70.35	83.47	-.35	-.36	1.27	.00	101.7	185.4	200.1	191.0	206.1	27.4	21.1	
Std Dv	.45	.37	.47	.51	.10	.09	.16	.00	18.6	1.7	25.6	.0	26.5	1.0	.0	
90% CI	.37	.31	.39	.42	.08	.07	.13	.00	15.3	1.4	21.0	.0	21.8	.8	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C25	86.84	83.25	71.27	84.64	-.28	-.26	1.69	.00	130.1	182.1	238.3	185.5	242.6	29.8	20.6	N-S
C26	87.08	83.50	72.41	85.76	.24	.24	1.49	.00	137.9	190.5	284.1	185.5	276.6	29.8	20.6	N-S
C27	86.31	82.46	70.90	85.63	-.16	-.42	.89	.00	115.9	181.2	201.5	185.5	206.2	24.7	20.6	N-S
C28	87.40	83.22	73.82	88.57	.08	-.07	1.31	.00	121.1	185.0	216.1	185.5	216.6	27.8	20.6	N-S
C29	86.63	83.20	71.31	85.42	.05	.07	1.10	.00	123.5	187.2	224.5	185.5	222.4	26.7	20.6	N-S
C30	87.64	84.19	73.62	87.51	-.79	-.70	1.25	.00	121.7	173.9	204.5	185.5	218.0	25.7	20.6	N-S
Avg.	86.98	83.30	72.22	86.26	-.14	-.19	1.29	.00	125.0	183.3	228.2	185.5	230.4	27.4	20.6	
Std Dv	.49	.56	1.27	1.47	.37	.34	.28	.00	7.8	5.7	30.5	.0	25.6	2.1	.0	
90% CI	.41	.46	1.04	1.21	.30	.28	.23	.00	6.4	4.7	25.1	.0	21.1	1.7	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	80.90	77.83	68.56	82.15	.36	.31	.32	-.26	105.0	220.8	228.5	211.2	218.7	41.7	37.0	N-S
A2	80.92	77.78	68.62	82.35	.01	-.04	-.63	-.34	101.3	213.8	218.0	211.2	215.4	32.4	37.0	S-N
A3	80.55	77.48	67.79	81.05	.70	.67	.19	-.14	99.4	227.2	230.3	211.2	214.1	41.7	37.0	N-S
A4	80.46	77.38	68.13	81.63	-.05	-.02	-.62	-.13	103.4	212.9	219.0	211.2	217.2	32.4	37.0	S-N
A5	81.00	77.90	68.16	81.69	.54	.47	.54	-.14	47.4	222.9	302.9	211.2	287.0	44.2	37.0	N-S
A7	81.52	78.36	68.53	82.47	-.02	-.04	-.68	-.13	104.6	212.5	219.6	211.2	218.3	31.9	37.0	S-N
Avg.	80.89	77.79	68.30	81.89	.26	.23	-.15	-.19	93.5	218.3	236.4	211.2	228.4	37.4	37.0	
Std Dv	.38	.35	.33	.53	.32	.31	.56	.09	22.7	6.2	33.0	.0	28.7	5.7	.0	
90% CI	.31	.29	.27	.44	.27	.25	.46	.07	18.7	5.1	27.1	.0	23.6	4.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation
Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-C-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D8	82.17	78.85	69.28	83.15	.59	.54	.05	.09	103.1	224.1	230.1	211.2	216.9	44.2	41.2	N-S
D9	82.97	79.88	70.00	83.61	-.03	-.04	-.30	.09	105.0	212.4	219.9	211.2	218.7	38.6	41.2	S-N
Avg.	82.57	79.36	69.64	83.38	.28	.25	-.13	.09	104.1	218.3	225.0	211.2	217.8	41.4	41.2	
Std Dv	.57	.73	.51	.33	.44	.41	.25	.00	1.3	8.3	7.2	.0	1.3	4.0	.0	
90% CI	2.53	3.25	2.27	1.45	1.96	1.83	1.10	.00	6.0	36.9	32.2	.0	5.7	17.7	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D10	80.69	77.31	67.32	80.95	.37	.38	.32	-.32	98.0	220.8	222.9	211.2	213.3	37.0	32.9	N-S
D11	81.19	77.93	67.52	81.58	.05	-.05	-.68	-.18	105.5	212.1	220.2	211.2	219.2	28.3	32.9	S-N
Avg.	80.94	77.62	67.42	81.26	.21	.16	-.18	-.25	101.8	216.5	221.5	211.2	216.3	32.7	32.9	
Std Dv	.35	.44	.14	.45	.23	.30	.71	.10	5.3	6.2	1.9	.0	4.2	6.2	.0	
90% CI	1.58	1.96	.63	1.99	1.01	1.36	3.16	.44	23.7	27.5	8.5	.0	18.6	27.5	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D12	80.92	77.51	67.91	81.64	.45	.45	.62	-.14	109.8	222.2	236.1	211.2	224.4	35.0	28.8	N-S
D13	80.55	77.59	67.76	81.59	.39	.36	-.67	-.10	105.1	220.2	228.2	211.2	218.8	25.7	28.8	S-N
Avg.	80.74	77.55	67.84	81.61	.42	.41	-.03	-.12	107.4	221.2	232.1	211.2	221.6	30.4	28.8	
Std Dv	.26	.06	.11	.04	.04	.06	.91	.03	3.3	1.4	5.6	.0	4.0	6.6	.0	
90% CI	1.17	.25	.47	.16	.19	.28	4.07	.13	14.8	6.3	24.9	.0	17.7	29.4	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D14	81.20	77.59	66.95	80.74	.53	.42	.51	.00	96.9	223.0	224.6	211.2	212.7	29.3	24.7	N-S
D16	81.49	78.48	66.96	80.74	-.09	-.04	-.91	.04	93.4	211.9	212.3	211.2	211.6	20.1	24.7	S-N
Avg.	81.35	78.02	66.96	80.74	.22	.19	-.20	.02	95.2	217.4	218.5	211.2	212.1	24.7	24.7	
Std Dv	.21	.61	.01	.00	.44	.33	1.00	.03	2.5	7.8	8.7	.0	.8	6.5	.0	
90% CI	.92	2.72	.03	.00	1.96	1.45	4.48	.13	11.0	35.0	38.8	.0	3.5	29.0	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation

Volpe Center
Acoustics Facility

May 3, 1993

TABLE B-D-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND DIRECTED EXHAUST
4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B16	92.50	90.87	81.80	93.51	.27	.21	.41	.00	68.6	120.7	129.7	118.2	127.0	23.7	21.1	N-S
B17	93.90	92.44	82.34	94.42	.36	.31	.72	.00	88.8	122.0	122.0	118.2	118.2	25.7	21.1	N-S
B18	93.74	91.87	81.77	93.94	.39	.04	.74	.00	78.1	121.6	124.3	118.2	120.8	25.7	21.1	N-S
B20	90.94	89.07	78.65	91.05	.20	.14	.88	.00	116.9	120.0	134.6	118.2	132.6	26.2	21.1	N-S
B21	89.44	86.83	77.30	90.11	.46	.19	.03	.00	77.0	123.1	126.3	118.2	121.3	22.1	21.1	N-S
B22	91.80	88.80	79.69	92.21	.69	-.54	.58	.00	100.6	126.1	128.3	118.2	120.3	25.7	21.1	N-S
Avg.	92.05	89.98	80.26	92.54	.40	.06	.56	.00	88.3	122.2	127.5	118.2	123.4	24.9	21.1	
Std Dv	1.71	2.12	2.03	1.71	.17	.31	.30	.00	17.8	2.2	4.4	.0	5.4	1.6	.0	
90% CI	1.41	1.75	1.67	1.41	.14	.25	.25	.00	14.7	1.8	3.6	.0	4.4	1.3	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C24	86.03	82.71	72.39	86.07	-.13	-.34	.33	.00	104.6	106.1	109.6	109.1	112.7	21.6	20.6	N-S
C25	85.17	81.90	71.12	85.10	-.07	-.18	.41	.00	107.8	106.7	112.1	109.1	114.6	22.1	20.6	N-S
C26	86.39	83.15	72.85	86.86	-.09	-.23	.71	.00	102.9	106.5	109.3	109.1	111.9	23.7	20.6	N-S
C27	85.74	82.41	72.31	86.44	.19	.02	-.23	.00	98.7	109.5	110.7	109.1	110.4	19.5	20.6	N-S
C28	85.30	82.29	71.91	85.94	.07	-.05	-.07	.00	112.3	108.0	116.8	109.1	117.9	20.1	20.6	N-S
C29	86.17	82.16	71.78	86.24	1.36	.52	-.50	.00	91.3	122.5	122.6	109.1	109.1	20.6	20.6	N-S
Avg.	85.80	82.44	72.06	86.11	.22	-.04	.11	.00	102.9	109.9	113.5	109.1	112.8	21.3	20.6	
Std Dv	.49	.44	.60	.59	.57	.30	.45	.00	7.3	6.3	5.2	.0	3.1	1.5	.0	
90% CI	.40	.36	.49	.49	.47	.25	.37	.00	6.0	5.2	4.3	.0	2.6	1.3	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	80.80	77.02	66.96	81.40	1.01	.22	.14	.58	80.7	161.9	164.1	148.8	150.7	41.7	37.0	N-S
A2	81.60	78.35	68.90	83.50	.40	.35	-.38	.54	98.3	153.4	155.0	148.8	150.3	35.0	37.0	S-N
A3	79.85	76.62	68.45	82.66	1.02	.72	.14	.23	97.1	162.2	163.4	148.8	149.9	41.7	37.0	N-S
A4	80.14	77.04	67.95	81.56	1.53	1.35	-.56	.29	114.1	169.3	185.4	148.8	162.9	37.0	37.0	S-N
A5	81.00	77.84	68.71	82.91	1.18	.91	.30	.41	101.6	162.2	165.6	148.8	151.9	43.2	37.0	N-S
A6	80.97	77.75	68.73	82.49	1.29	1.02	-.80	.41	93.1	164.0	164.2	148.8	149.0	34.0	37.0	S-N
Avg.	80.73	77.44	68.28	82.42	1.07	.76	-.19	.41	97.5	162.2	166.3	148.8	152.4	38.8	37.0	
Std Dv	.63	.65	.73	.81	.38	.42	.45	.14	10.9	5.1	10.1	.0	5.2	3.9	.0	
90% CI	.52	.53	.60	.66	.31	.35	.37	.11	9.0	4.2	8.3	.0	4.3	3.2	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-D-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND DIRECTED EXHAUST
4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts 1.0Vh																
D7	82.03	78.85	69.25	83.00	1.02	.65	.09	.83	109.7	161.9	171.9	148.8	158.0	45.8	41.2	N-S
D9	82.22	78.52	69.18	83.69	.76	.28	-.91	.99	94.0	158.4	158.8	148.8	149.1	35.5	41.2	S-N
Avg.	82.13	76.68	69.21	83.35	.89	.46	-.41	.91	101.8	160.1	165.4	148.8	153.6	40.7	41.2	
Std Dv	.13	.23	.05	.49	.18	.26	.71	.11	11.1	2.5	9.3	.0	6.3	7.3	.0	
90% CI	.66	1.04	.22	2.18	.82	1.17	3.16	.51	49.6	11.0	41.4	.0	28.1	32.5	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D10	79.70	76.62	67.01	81.00	.73	.44	.54	.11	99.0	157.8	159.8	148.8	150.6	39.6	32.9	N-S
D11	80.29	77.42	67.90	81.50	1.15	.95	-.76	.20	104.1	163.5	168.5	148.8	153.3	30.3	32.9	S-N
Avg.	79.99	77.02	67.46	81.25	.94	.69	-.11	.16	101.6	160.6	164.1	148.8	152.0	34.9	32.9	
Std Dv	.42	.57	.63	.35	.30	.36	.92	.06	3.6	4.0	6.2	.0	1.9	6.6	.0	
90% CI	1.86	2.53	2.81	1.58	1.33	1.61	4.10	.28	16.1	18.0	27.5	.0	8.5	29.4	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D12	81.03	78.01	68.70	81.83	.83	.71	.41	.02	84.4	159.4	160.2	148.8	149.4	34.0	28.8	N-S
D13	80.90	77.26	67.79	82.02	.84	.24	-.67	.01	94.2	157.9	158.3	148.8	149.1	26.2	28.8	S-N
Avg.	80.96	77.63	68.24	81.93	.83	.47	-.13	.01	89.3	158.6	159.3	148.8	149.3	30.1	28.8	
Std Dv	.09	.53	.64	.13	.01	.33	.76	.01	6.9	1.1	1.3	.0	.2	5.5	.0	
90% CI	.41	2.37	2.87	.60	.03	1.48	3.41	.03	30.9	4.7	6.0	.0	.9	24.6	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D14	81.04	77.26	66.84	80.73	.82	.09	.61	-.05	77.2	158.9	163.0	148.8	152.5	30.3	24.7	N-S
D15	82.11	78.92	68.10	82.15	.94	.82	-.56	-.05	101.1	160.6	163.7	148.8	151.6	23.4	24.7	S-N
Avg.	81.57	78.09	67.47	81.44	.88	.45	.03	-.05	89.1	159.8	163.4	148.8	152.1	26.8	24.7	
Std Dv	.76	1.17	.89	1.00	.08	.52	.83	.00	16.9	1.2	.5	.0	.6	4.9	.0	
90% CI	3.38	5.24	3.98	4.48	.38	2.30	3.69	.00	75.5	5.4	2.2	.0	2.8	21.8	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

TABLE B-D-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B16	87.69	85.82	76.21	88.33	.40	.19	.39	.00	59.9	196.1	226.6	191.0	220.7	23.7	21.1	N-S
B17	88.58	87.25	77.05	88.72	.42	.35	.71	.00	95.2	197.5	198.3	191.0	191.7	25.7	21.1	N-S
B18	87.81	86.33	76.21	87.55	.32	.23	.77	.00	84.8	195.2	196.0	191.0	191.7	25.7	21.1	N-S
B20	84.85	83.06	74.40	85.60	.19	.11	.91	.00	53.0	192.6	241.2	191.0	239.2	26.2	21.1	N-S
B21	84.26	80.69	70.40	82.89	.43	-1.01	.09	.00	65.5	196.4	215.8	191.0	209.8	22.1	21.1	N-S
B22	85.24	83.48	73.17	84.74	.49	.39	.70	.00	98.9	198.3	200.7	191.0	193.3	25.7	21.1	N-S
Avg.	86.41	84.44	74.57	86.31	.38	.04	.59	.00	76.2	196.0	213.1	191.0	207.7	24.9	21.1	
Std Dv	1.83	2.46	2.49	2.28	.11	.53	.30	.00	19.3	2.0	18.1	.0	19.4	1.6	.0	
90% CI	1.50	2.02	2.05	1.88	.09	.43	.25	.00	15.9	1.6	14.9	.0	16.0	1.3	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C24	81.28	78.33	66.46	79.62	.06	-.59	.25	.00	79.9	183.7	186.6	185.5	188.3	21.6	20.6	N-S
C25	80.92	78.59	67.43	80.72	.10	-.10	.34	.00	85.3	184.1	184.7	185.5	186.1	22.1	20.6	N-S
C26	81.19	78.46	66.88	80.06	.33	.03	.55	.00	84.9	187.9	188.6	185.5	186.2	23.7	20.6	N-S
C27	81.57	79.12	67.32	81.07	.59	.44	-.39	.00	78.9	192.7	196.3	185.5	189.0	19.5	20.6	N-S
C28	81.31	78.20	67.15	80.62	.62	-.15	-.27	.00	83.7	192.6	193.8	185.5	186.6	20.1	20.6	N-S
C29	81.59	78.96	68.24	80.41	1.01	.82	-.32	.00	101.2	199.7	203.6	185.5	189.1	20.6	20.6	N-S
Avg.	81.31	78.61	67.25	80.42	.45	.07	.03	.00	85.7	190.1	192.3	185.5	187.6	21.3	20.6	
Std Dv	.25	.36	.60	.51	.36	.49	.40	.00	8.1	6.1	7.1	.0	1.4	1.5	.0	
90% CI	.21	.30	.49	.42	.30	.41	.33	.00	6.6	5.0	5.8	.0	1.2	1.3	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	79.11	75.40	63.72	77.49	1.11	-.07	.17	1.39	66.5	228.2	248.8	211.2	230.3	41.7	37.0	N-S
A2	79.93	77.57	66.70	79.37	.97	.34	-.37	.57	94.2	217.3	217.8	211.2	211.8	35.0	37.0	S-N
A3	78.45	75.64	65.13	78.18	.78	.38	.30	.60	67.3	221.9	240.4	211.2	228.9	41.7	37.0	N-S
A4	79.39	76.51	66.44	79.45	1.23	.82	-.38	.35	102.7	230.6	236.3	211.2	216.5	37.0	37.0	S-N
A5	79.55	76.72	66.45	79.73	.67	.46	.50	1.04	107.4	219.8	230.4	211.2	221.3	43.2	37.0	N-S
A6	79.60	76.45	66.13	79.56	.73	.39	-.58	.48	82.1	221.2	223.3	211.2	213.3	34.0	37.0	S-N
Avg.	79.34	76.38	65.76	78.96	.92	.39	-.06	.74	86.7	223.2	232.8	211.2	220.4	38.8	37.0	
Std Dv	.51	.78	1.14	.91	.22	.28	.44	.40	17.6	5.1	11.4	.0	7.9	3.9	.0	
90% CI	.42	.64	.94	.75	.18	.23	.36	.33	14.5	4.2	9.4	.0	6.5	3.2	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-D-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND DIRECTED EXHAUST
4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D7	80.85	78.34	68.30	80.97	.49	.40	.32	2.24	103.1	218.4	224.2	211.2	216.9	45.8	41.2	N-S
D9	81.08	78.08	66.94	80.00	.82	.06	-.89	1.30	104.3	223.7	230.8	211.2	217.9	35.5	41.2	S-N
Avg.	80.96	78.21	67.62	80.49	.65	.23	-.28	1.77	103.7	221.0	227.5	211.2	217.4	40.7	41.2	
Std Dv	.16	.18	.96	.69	.23	.24	.86	.66	.8	3.7	4.7	.0	.7	7.3	.0	
90% CI	.73	.82	4.29	3.06	1.04	1.07	3.82	2.97	3.8	16.7	20.8	.0	3.2	32.5	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D10	77.66	74.88	64.44	76.86	.82	-.23	.56	.24	74.3	223.3	231.9	211.2	219.4	39.6	32.9	N-S
D11	78.26	76.00	65.54	77.73	.97	.75	-.65	.10	106.1	226.1	235.4	211.2	219.8	30.3	32.9	S-N
Avg.	77.96	75.44	64.99	77.29	.89	.26	-.04	.17	90.2	224.7	233.6	211.2	219.6	34.9	32.9	
Std Dv	.42	.79	.78	.62	.11	.69	.86	.10	22.5	2.0	2.5	.0	.3	6.6	.0	
90% CI	1.89	3.54	3.47	2.75	.47	3.09	3.82	.44	100.4	8.8	11.0	.0	1.3	29.4	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D12	77.39	75.13	64.14	76.04	.54	.32	.55	-.08	106.0	219.1	227.9	211.2	219.7	34.0	28.8	N-S
D13	78.55	76.23	65.62	78.39	.42	.34	-.53	-.01	84.9	217.3	218.2	211.2	212.1	26.2	28.8	S-N
Avg.	77.97	75.68	64.88	77.21	.48	.33	.01	-.04	95.4	218.2	223.0	211.2	215.9	30.1	28.8	
Std Dv	.82	.78	1.05	1.66	.08	.01	.76	.05	14.9	1.3	6.9	.0	5.4	5.5	.0	
90% CI	3.66	3.47	4.67	7.42	.38	.06	3.41	.22	66.6	5.7	30.6	.0	24.0	24.6	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D14	78.27	76.06	65.00	77.02	.70	.60	.67	-.23	75.7	222.9	230.0	211.2	218.0	30.3	24.7	N-S
D15	79.27	77.12	65.63	78.42	.62	.50	-.47	-.18	88.1	220.6	220.7	211.2	211.3	23.1	24.7	S-N
Avg.	78.99	76.59	65.32	77.72	.66	.55	.10	-.21	81.9	221.8	225.4	211.2	214.6	26.7	24.7	
Std Dv	1.03	.75	.45	.99	.06	.07	.81	.04	8.8	1.6	6.6	.0	4.7	5.1	.0	
90% CI	4.58	3.35	1.99	4.42	.25	.32	3.60	.16	39.1	7.3	29.4	.0	21.2	22.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation
Volpe Center
Acoustics Facility

TABLE B-D-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B16	85.41	83.27	70.80	83.61	-.01	-.08	.55	.00	78.1	188.9	193.1	191.0	195.1	23.7	21.1	N-S
B17	86.12	83.81	71.84	84.77	-.02	-.29	.90	.00	87.6	189.0	189.2	191.0	191.1	25.7	21.1	N-S
B18	85.80	83.46	71.22	84.05	.09	.02	.86	.00	96.3	190.9	192.1	191.0	192.1	25.7	21.1	N-S
B20	85.39	83.66	71.67	83.80	.12	.06	.94	.00	87.3	191.6	191.8	191.0	191.2	26.2	21.1	N-S
B21	84.23	81.55	70.70	82.77	.15	-.35	.19	.00	83.7	191.7	192.8	191.0	192.1	22.1	21.1	N-S
B22	85.20	82.77	71.22	84.74	.27	.09	.80	.00	102.8	193.6	198.6	191.0	195.8	25.7	21.1	N-S
Avg.	85.36	83.09	71.24	83.96	.10	-.09	.71	.00	89.3	191.0	192.9	191.0	192.9	24.9	21.1	
Std Dv	.64	.84	.45	.75	.11	.19	.29	.00	8.9	1.8	3.1	.0	2.0	1.6	.0	
90% CI	.53	.69	.37	.62	.09	.15	.24	.00	7.3	1.5	2.6	.0	1.7	1.3	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C24	84.45	80.96	68.25	82.23	.07	-.66	.25	.00	129.4	183.7	237.7	185.5	240.0	21.6	20.6	N-S
C25	84.23	81.39	68.72	82.01	.07	-.02	.34	.00	95.7	184.1	185.0	185.5	186.4	22.1	20.6	N-S
C26	84.54	81.72	70.43	83.16	-.21	-.26	.74	.00	88.7	179.9	180.0	185.5	185.5	23.7	20.6	N-S
C27	83.52	80.56	69.33	82.24	-.30	-.52	-.05	.00	81.4	178.4	180.4	185.5	187.6	19.5	20.6	N-S
C28	84.09	80.52	68.24	82.49	-.40	-1.10	.10	.00	136.9	176.7	258.8	185.5	271.5	20.1	20.6	N-S
C29	84.03	81.10	69.68	82.67	.25	.16	-.05	.00	96.1	187.4	188.5	185.5	186.5	20.6	20.6	N-S
Avg.	84.14	81.04	69.11	82.47	-.09	-.40	.22	.00	104.7	181.7	205.1	185.5	209.6	21.3	20.6	
Std Dv	.36	.47	.87	.41	.25	.46	.30	.00	22.8	4.0	34.3	.0	37.1	1.5	.0	
90% CI	.30	.39	.71	.34	.21	.38	.25	.00	18.8	3.3	28.2	.0	30.5	1.3	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	79.12	76.40	66.28	79.09	.18	.09	.48	.59	86.9	212.9	213.2	211.2	211.5	41.7	37.0	N-S
A2	79.60	77.17	65.81	78.74	.12	.09	-.26	1.32	122.6	211.7	251.2	211.2	250.6	35.0	37.0	S-N
A3	79.61	76.38	65.72	78.59	.65	.01	.34	.28	67.1	219.8	238.6	211.2	229.2	41.7	37.0	N-S
A4	79.15	76.68	65.01	77.45	.73	.42	-.21	.75	98.9	221.7	224.4	211.2	213.8	37.0	37.0	S-N
A5	79.73	77.26	67.20	79.66	.74	.55	.46	.48	96.8	221.9	223.5	211.2	212.7	43.2	37.0	N-S
A6	78.47	76.01	64.51	77.18	.81	.62	-.62	1.04	90.8	223.2	223.3	211.2	211.2	34.0	37.0	S-N
Avg.	79.28	76.65	65.76	78.45	.54	.30	.03	.74	93.8	218.5	229.0	211.2	221.5	38.8	37.0	
Std Dv	.47	.49	.95	.96	.31	.27	.46	.38	18.1	5.0	13.6	.0	15.8	3.9	.0	
90% CI	.39	.40	.78	.79	.25	.22	.38	.31	14.9	4.1	11.1	.0	13.0	3.2	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-D-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND DIRECTED EXHAUST
4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D7	81.08	77.65	66.57	79.78	.74	.14	.23	1.12	97.1	222.9	224.7	211.2	212.9	45.8	41.2	N-S
D9	81.55	78.87	67.80	80.50	.26	.11	-.66	2.63	91.4	212.4	212.5	211.2	211.3	35.5	41.2	S-N
Avg.	81.32	78.26	67.18	80.14	.50	.13	-.21	1.88	94.3	217.6	218.6	211.2	212.1	40.7	41.2	
Std Dv	.33	.86	.87	.51	.34	.02	.63	1.07	4.0	7.4	8.6	.0	1.1	7.3	.0	
90% CI	1.48	3.85	3.88	2.27	1.52	.09	2.81	4.77	18.0	33.1	38.5	.0	5.1	32.5	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D10	78.91	75.87	64.15	77.52	.26	-.35	.79	.09	52.0	211.9	269.0	211.2	268.1	39.6	32.9	N-S
D11	78.97	76.45	65.20	77.90	.49	.36	-.48	.40	103.2	217.5	223.4	211.2	217.0	30.3	32.9	S-N
Avg.	78.94	76.12	64.68	77.71	.38	.01	.16	.25	77.6	214.7	246.2	211.2	242.6	34.9	32.9	
Std Dv	.04	.47	.74	.27	.16	.50	.90	.22	36.2	4.0	32.2	.0	36.1	6.6	.0	
90% CI	.19	2.12	3.31	1.20	.73	2.24	4.01	.98	161.6	17.7	144.0	.0	161.3	29.4	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D12	79.30	76.24	65.19	78.34	.54	.42	.56	-.13	75.5	218.7	225.8	211.2	218.1	34.0	28.8	N-S
D13	78.87	76.22	65.20	77.54	.49	.39	-.55	.00	84.9	218.2	219.0	211.2	212.1	26.2	28.8	S-N
Avg.	79.09	76.23	65.19	77.94	.51	.40	.00	-.06	80.2	218.4	222.4	211.2	215.1	30.1	28.8	
Std Dv	.30	.01	.01	.57	.04	.02	.78	.09	6.6	.4	4.8	.0	4.2	5.5	.0	
90% CI	1.36	.06	.03	2.53	.16	.09	3.50	.41	29.7	1.6	21.5	.0	18.9	24.6	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D14	79.99	77.00	66.17	79.63	.38	.24	.84	-.18	136.3	214.1	309.7	211.2	305.6	30.3	24.7	N-S
D15	79.22	76.64	65.24	77.58	.54	.42	-.44	-.23	88.1	218.9	219.0	211.2	211.3	23.1	24.7	S-N
Avg.	79.60	76.82	65.71	78.60	.46	.33	.20	-.21	112.2	216.5	264.4	211.2	258.5	26.7	24.7	
Std Dv	.54	.25	.66	1.45	.11	.13	.91	.04	34.1	3.4	64.1	.0	66.7	5.1	.0	
90% CI	2.43	1.14	2.94	6.47	.51	.57	4.04	.16	152.2	15.2	286.3	.0	297.7	22.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation
Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-E-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER
2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/24/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B15	90.67	88.34	79.36	91.65	.16	.17	1.09	.00	91.2	121.3	121.3	118.2	118.2	27.8	21.1	N-S
B16	88.56	85.90	75.80	89.58	-.45	-.46	1.44	.00	104.7	113.9	117.7	118.2	122.2	28.3	21.1	N-S
B17	89.75	87.12	76.20	89.73	-.31	-.37	1.53	.00	111.9	115.6	124.6	118.2	127.4	29.3	21.1	N-S
B18	90.60	87.78	76.00	89.43	-.06	-.57	1.28	.00	106.9	118.3	123.7	118.2	123.6	28.3	21.1	N-S
B19	91.53	89.27	79.33	91.96	-.07	-.06	1.03	.00	86.7	118.2	118.4	118.2	118.4	26.7	21.1	N-S
B20	94.04	92.44	82.50	94.39	.09	.09	.78	.00	71.5	120.4	127.0	118.2	124.7	25.7	21.1	N-S
Avg.	90.86	88.47	78.20	91.12	-.11	-.20	1.19	.00	95.5	118.0	122.1	118.2	122.4	27.7	21.1	
Std Dv	1.85	2.25	2.67	1.94	.23	.31	.28	.00	15.2	2.8	3.6	.0	3.6	1.3	.0	
90% CI	1.53	1.85	2.20	1.60	.19	.25	.23	.00	12.5	2.3	3.0	.0	3.0	1.1	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
E1	88.76	84.51	74.64	89.11	1.61	1.52	-.08	.00	138.9	128.0	194.7	109.1	165.9	23.7	20.6	N-S
E2	89.26	84.97	74.91	89.96	1.13	1.10	-.21	.00	135.6	122.9	175.6	109.1	155.9	22.1	20.6	N-S
E3	89.14	84.86	75.10	89.70	1.94	1.89	-.72	.00	139.6	132.2	203.9	109.1	168.3	21.1	20.6	N-S
E5	89.21	84.35	74.80	89.57	1.36	1.30	-.39	.00	135.5	125.3	178.9	109.1	155.8	21.6	20.6	N-S
E6	89.50	85.10	74.69	89.56	2.13	2.00	-.70	.00	136.6	134.6	196.0	109.1	158.9	21.6	20.6	N-S
E7	88.99	84.57	73.84	88.59	1.08	1.04	-.29	.00	134.7	122.3	172.2	109.1	153.6	21.6	20.6	N-S
Avg.	89.14	84.81	74.66	89.42	1.54	1.47	-.40	.00	136.8	127.5	186.9	109.1	159.7	21.9	20.6	
Std Dv	.25	.23	.44	.49	.43	.40	.26	.00	2.0	5.0	13.0	.0	6.0	.9	.0	
90% CI	.21	.19	.36	.40	.35	.33	.22	.00	1.6	4.1	10.7	.0	4.9	.8	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9 Vh																
A1	83.22	79.28	71.49	86.36	.53	.53	.36	-.69	111.5	159.7	171.7	148.8	159.8	43.2	37.0	N-S
A2	83.17	79.45	71.01	85.95	.35	.37	-.74	-.69	108.7	157.0	165.7	148.8	157.0	32.9	37.0	S-N
A3	83.42	79.72	71.02	85.97	.23	.24	.50	-.47	108.2	154.9	163.0	148.8	156.6	43.2	37.0	N-S
A4	83.06	79.19	71.26	86.17	.23	.27	-.63	-.88	112.1	155.5	167.8	148.8	160.6	33.4	37.0	S-N
A5	82.73	79.34	70.60	85.25	.12	.11	.75	-.47	111.0	152.8	163.7	148.8	159.4	45.3	37.0	N-S
A6	83.42	79.49	70.83	85.48	-.05	-.01	-.72	-.69	117.7	151.2	170.7	148.8	168.0	31.9	37.0	S-N
Avg.	83.17	79.41	71.04	85.86	.24	.25	-.08	-.65	111.5	155.2	167.1	148.8	160.2	38.3	37.0	
Std Dv	.26	.19	.31	.42	.20	.19	.69	.16	3.4	3.0	3.6	.0	4.1	6.2	.0	
90% CI	.21	.15	.26	.35	.16	.16	.57	.13	2.8	2.5	3.0	.0	3.4	5.1	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

TABLE B-E-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER 2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/24/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D7	83.49	79.55	72.46	87.22	.41	.41	.39	-.37	118.2	157.9	179.2	148.8	168.8	47.8	41.2	N-S
D8	83.96	79.83	72.01	86.92	.20	.15	-.62	-.37	99.1	154.2	156.2	148.8	150.6	37.0	41.2	S-N
Avg.	83.72	79.69	72.24	87.07	.31	.28	-.12	-.37	108.6	156.0	167.7	148.8	159.7	42.4	41.2	
Std Dv	.33	.20	.32	.21	.15	.18	.71	.00	13.5	2.6	16.3	.0	12.9	7.6	.0	
90% CI	1.48	.88	1.42	.95	.66	.82	3.19	.00	60.3	11.7	72.6	.0	57.5	34.1	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D9	82.97	79.55	70.08	84.71	.61	.56	.49	-.41	113.1	159.7	173.7	148.8	161.7	39.6	32.9	N-S
D10	83.48	79.49	70.17	84.88	.44	.40	-.74	-.38	107.8	157.3	165.2	148.8	156.3	29.3	32.9	S-N
Avg.	83.22	79.52	70.13	84.79	.52	.48	-.13	-.39	110.4	158.5	169.4	148.8	159.0	34.4	32.9	
Std Dv	.36	.04	.06	.12	.12	.11	.87	.02	3.7	1.7	6.0	.0	3.8	7.3	.0	
90% CI	1.61	.19	.28	.54	.54	.51	3.88	.09	16.7	7.6	26.8	.0	17.0	32.5	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D11	83.94	80.02	70.42	85.12	.54	.47	.75	-.06	112.4	158.5	171.4	148.8	160.9	36.5	28.8	N-S
D12	84.42	80.45	69.96	84.74	.14	.10	-.87	-.05	109.0	152.7	161.6	148.8	157.3	24.2	28.8	S-N
Avg.	84.18	80.24	70.19	84.93	.34	.28	-.06	-.05	110.7	155.6	166.5	148.8	159.1	30.4	28.8	
Std Dv	.34	.30	.33	.27	.28	.26	1.15	.01	2.4	4.1	6.9	.0	2.5	8.7	.0	
90% CI	1.52	1.36	1.45	1.20	1.26	1.17	5.11	.03	10.7	18.3	30.9	.0	11.4	38.8	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D13	85.38	81.59	71.10	85.66	.78	.75	.99	.35	107.1	162.8	170.3	148.8	155.6	34.0	24.7	N-S
D14	85.13	80.82	69.68	84.30	.66	.36	-1.24	.36	105.1	160.8	166.5	148.8	154.1	20.1	24.7	S-N
Avg.	85.25	81.21	70.39	84.98	.72	.56	-.13	.36	106.1	161.8	168.4	148.8	154.9	27.0	24.7	
Std Dv	.18	.54	1.00	.96	.08	.28	1.58	.01	1.4	1.4	2.7	.0	1.1	9.8	.0	
90% CI	.79	2.43	4.48	4.29	.38	1.23	7.04	.03	6.3	6.3	12.0	.0	4.7	43.9	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-E-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER
2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/24/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B15	85.94	83.73	72.25	84.71	.08	-.14	1.12	.00	84.8	194.5	195.3	191.0	191.7	27.8	21.1	N-S
B16	84.46	82.01	68.95	81.38	.02	-.52	1.23	.00	96.9	193.3	194.7	191.0	192.4	28.3	21.1	N-S
B17	84.29	82.16	70.62	82.83	-.34	-.36	1.54	.00	88.9	186.2	186.2	191.0	191.0	29.3	21.1	N-S
B18	85.06	83.14	71.35	83.68	.06	.04	1.21	.00	90.5	194.1	194.1	191.0	191.0	28.3	21.1	N-S
B19	85.69	83.86	73.10	84.89	-.10	-.11	1.03	.00	78.3	191.0	195.0	191.0	195.0	26.7	21.1	N-S
B20	87.40	85.77	75.92	87.68	.34	.30	.67	.00	84.3	199.3	200.3	191.0	191.9	25.7	21.1	N-S
Avg.	85.47	83.44	72.03	84.19	.01	-.13	1.13	.00	87.3	193.1	194.3	191.0	192.2	27.7	21.1	
Std Dv	1.15	1.38	2.38	2.14	.22	.29	.29	.00	6.3	4.3	4.5	.0	1.5	1.3	.0	
90% CI	.94	1.13	1.96	1.76	.18	.24	.23	.00	5.2	3.6	3.7	.0	1.2	1.1	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
E1	85.66	82.06	69.04	83.35	.71	.63	.29	.00	129.8	199.7	259.8	185.5	241.2	23.7	20.6	N-S
E2	85.75	82.02	70.13	84.50	.46	.42	.07	.00	117.1	195.8	219.9	185.5	208.3	22.1	20.6	N-S
E3	85.97	82.46	69.93	84.15	.80	.75	-.26	.00	116.4	202.0	225.4	185.5	207.0	21.1	20.6	N-S
E5	85.66	82.00	69.33	83.56	.55	.51	-.06	.00	130.1	197.5	258.3	185.5	242.5	21.6	20.6	N-S
E6	85.83	82.17	69.68	84.16	.85	.71	-.17	.00	115.5	202.4	224.3	185.5	205.5	21.6	20.6	N-S
E7	85.40	81.73	69.39	83.63	.49	.35	-.03	.00	108.2	195.9	206.1	185.5	195.2	21.6	20.6	N-S
Avg.	85.71	82.07	69.58	83.89	.64	.56	-.03	.00	119.5	198.9	232.3	185.5	216.6	21.9	20.6	
Std Dv	.19	.24	.41	.44	.17	.16	.19	.00	8.7	2.9	21.8	.0	20.1	.9	.0	
90% CI	.16	.20	.33	.36	.14	.13	.16	.00	7.1	2.4	18.0	.0	16.5	.8	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	82.05	79.34	69.11	82.21	.21	.24	.49	-.69	98.9	220.3	223.1	211.2	213.8	43.2	37.0	N-S
A2	81.46	78.72	69.04	82.50	-.04	-.03	-.60	-.77	98.4	215.4	217.8	211.2	213.5	32.9	37.0	S-N
A3	81.84	78.87	68.88	82.12	-.06	-.11	.63	-.47	107.0	213.2	223.0	211.2	220.9	43.2	37.0	N-S
A4	81.44	78.97	69.43	82.66	.00	.00	-.56	-.99	96.5	217.3	218.7	211.2	212.6	33.4	37.0	S-N
A5	81.91	79.29	68.83	81.45	-.16	-.19	.87	-.47	103.8	211.1	217.3	211.2	217.5	45.3	37.0	N-S
A6	81.61	78.95	69.58	83.13	-.05	-.12	-.69	-.77	101.5	212.9	217.3	211.2	215.5	31.9	37.0	S-N
Avg.	81.72	79.02	69.14	82.35	-.02	-.04	.02	-.69	101.0	215.0	219.5	211.2	215.6	38.3	37.0	
Std Dv	.25	.24	.30	.57	.12	.15	.71	.20	3.9	3.4	2.8	.0	3.1	6.2	.0	
90% CI	.21	.20	.25	.47	.10	.12	.59	.16	3.2	2.8	2.3	.0	2.6	5.1	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department of Transportation

Volpe Center
Acoustics Facility

April 30, 1993

TABLE B-E-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER 2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/24/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D7	83.02	80.19	70.38	83.55	.03	.06	.52	-.37	119.4	217.8	249.9	211.2	242.4	47.8	41.2	N-S
D8	83.57	80.59	70.52	84.20	-.01	-.24	-.54	-.42	104.3	215.1	222.0	211.2	217.9	37.0	41.2	S-N
Avg.	83.29	80.39	70.45	83.88	.01	-.09	-.01	-.39	111.9	216.5	235.9	211.2	230.1	42.4	41.2	
Std Dv	.39	.28	.10	.46	.03	.21	.75	.04	10.7	1.9	19.7	.0	17.3	7.6	.0	
90% CI	1.74	1.26	.44	2.05	.13	.95	3.35	.16	47.7	8.5	88.1	.0	77.3	34.1	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D9	82.16	78.97	68.04	81.12	.13	-.30	.67	-.40	105.9	217.8	226.5	211.2	219.6	39.6	32.9	N-S
D10	81.65	78.71	68.10	81.48	.13	.11	-.63	-.41	101.9	217.5	222.3	211.2	215.9	29.3	32.9	S-N
Avg.	81.90	78.84	68.07	81.30	.13	-.10	.02	-.41	103.9	217.6	224.4	211.2	217.8	34.4	32.9	
Std Dv	.36	.18	.04	.25	.00	.29	.92	.01	2.8	.2	3.0	.0	2.6	7.3	.0	
90% CI	1.61	.82	.19	1.14	.00	1.29	4.10	.03	12.6	.9	13.3	.0	11.7	32.5	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D11	82.40	79.48	67.50	80.71	.15	-.01	.89	-.05	117.2	218.0	245.1	211.2	237.5	36.5	28.8	N-S
D12	83.02	79.87	67.76	80.83	-.22	-.24	-.78	-.03	111.6	212.1	228.2	211.2	227.2	24.2	28.8	S-N
Avg.	82.71	79.68	67.63	80.77	-.03	-.13	.06	-.04	114.4	215.1	236.6	211.2	232.4	30.4	28.8	
Std Dv	.44	.28	.18	.08	.26	.16	1.18	.01	4.0	4.2	12.0	.0	7.3	8.7	.0	
90% CI	1.96	1.23	.82	.38	1.17	.73	5.27	.06	17.7	18.6	53.4	.0	32.5	38.8	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D13	83.21	80.37	68.65	81.51	.31	.29	1.18	.37	92.8	221.3	221.6	211.2	211.5	34.0	24.7	N-S
D14	83.78	80.25	67.46	81.74	.04	-.42	-.99	.45	92.7	215.4	215.7	211.2	211.4	20.1	24.7	S-N
Avg.	83.49	80.31	68.06	81.63	.17	-.06	.09	.41	92.8	218.4	218.6	211.2	211.4	27.0	24.7	
Std Dv	.40	.08	.84	.16	.19	.50	1.53	.06	.1	4.2	4.2	.0	.1	9.8	.0	
90% CI	1.80	.38	3.76	.73	.85	2.24	6.85	.25	.3	18.6	18.6	.0	.3	43.9	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department of Transportation
Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-E-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER
2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/24/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B15	86.69	83.59	71.01	84.27	-.12	-1.13	1.19	.00	101.2	191.2	194.9	191.0	194.7	27.8	21.1	N-S
B16	84.87	82.90	70.13	82.83	-.57	-.54	1.46	.00	97.5	183.1	184.7	191.0	192.6	28.3	21.1	N-S
B17	85.79	82.97	70.66	82.48	-.07	-.94	1.40	.00	63.8	192.4	214.4	191.0	212.7	29.3	21.1	N-S
B18	85.65	83.87	72.87	83.47	-.35	-.31	1.35	.00	49.7	187.9	246.2	191.0	250.3	28.3	21.1	N-S
B19	85.92	84.02	71.48	83.50	-.17	-.33	1.03	.00	44.6	191.0	271.9	191.0	271.9	26.7	21.1	N-S
B20	86.39	84.34	71.74	83.55	-.46	-.78	1.00	.00	103.7	185.0	190.4	191.0	196.5	25.7	21.1	N-S
Avg.	85.89	83.61	71.32	83.35	-.29	-.67	1.24	.00	76.8	188.4	217.1	191.0	219.8	27.7	21.1	
Std Dv	.63	.58	.95	.62	.20	.33	.20	.00	27.2	3.8	35.0	.0	33.5	1.3	.0	
90% CI	.52	.48	.78	.51	.17	.27	.16	.00	22.3	3.1	28.8	.0	27.5	1.1	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
E1	86.54	83.13	70.87	85.50	.34	.35	.40	.00	124.1	194.6	235.2	185.5	224.1	23.7	20.6	N-S
E2	86.91	83.12	71.68	86.00	.18	.04	.16	.00	120.1	192.0	221.8	185.5	214.3	22.1	20.6	N-S
E3	86.91	83.28	70.60	84.58	.56	.52	-.17	.00	127.6	197.9	249.8	185.5	234.1	21.1	20.6	N-S
E5	87.20	83.50	71.11	85.67	.26	.27	.03	.00	122.8	193.3	229.9	185.5	220.6	21.6	20.6	N-S
E6	87.14	83.49	71.59	86.00	.72	.67	-.13	.00	124.8	200.6	244.2	185.5	225.8	21.6	20.6	N-S
E7	86.93	83.02	71.23	85.27	.10	.01	.08	.00	126.1	191.2	236.4	185.5	229.4	21.6	20.6	N-S
Avg.	86.94	83.26	71.18	85.50	.36	.31	.06	.00	124.2	194.9	236.2	185.5	224.7	21.9	20.6	
Std Dv	.23	.20	.41	.53	.24	.26	.21	.00	2.6	3.6	10.0	.0	6.9	.9	.0	
90% CI	.19	.17	.34	.44	.19	.21	.17	.00	2.2	3.0	8.2	.0	5.7	.8	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A1	81.55	78.79	69.36	83.06	.10	.11	.54	-.77	93.7	217.8	218.3	211.2	211.7	43.2	37.0	N-S
A2	82.08	79.24	69.10	82.15	.16	.14	-.66	-.69	89.8	218.8	218.8	211.2	211.2	32.9	37.0	S-N
A3	81.98	78.81	69.17	82.30	.11	-.20	.54	-.53	106.5	217.9	227.3	211.2	220.3	43.2	37.0	N-S
A4	81.83	79.01	69.89	83.10	-.08	-.02	-.51	-.88	96.7	214.7	216.2	211.2	212.7	33.4	37.0	S-N
A5	81.34	78.81	69.07	81.98	.07	.09	.75	-.53	103.1	217.0	222.8	211.2	216.8	45.3	37.0	N-S
A6	82.29	79.45	70.15	83.04	-.27	-.20	-.69	-.69	128.0	212.9	270.1	211.2	267.9	31.9	37.0	S-N
Avg.	81.85	79.02	69.46	82.61	.02	-.01	-.00	-.68	103.0	216.5	228.9	211.2	223.4	38.3	37.0	
Std Dv	.35	.27	.46	.52	.16	.15	.68	.14	13.7	2.3	20.6	.0	22.1	6.2	.0	
90% CI	.29	.23	.37	.42	.13	.13	.56	.11	11.3	1.9	16.9	.0	18.1	5.1	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department of Transportation
Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-E-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER 2-BLADE 46" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/24/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D7	82.73	80.01	70.07	83.26	.11	.11	.52	-.42	109.5	217.8	231.0	211.2	224.1	47.8	41.2	N-S
D8	82.66	79.26	69.56	82.84	-.15	-.62	-.54	-.37	129.6	215.1	279.1	211.2	274.0	37.0	41.2	S-N
Avg.	82.69	79.63	69.82	83.05	-.02	-.25	-.01	-.39	119.6	216.5	255.1	211.2	249.1	42.4	41.2	
Std Dv	.05	.53	.36	.30	.18	.52	.75	.04	14.2	1.9	34.0	.0	35.3	7.6	.0	
90% CI	.22	2.37	1.61	1.33	.82	2.30	3.35	.16	63.5	8.5	151.9	.0	157.5	34.1	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D9	81.10	78.06	68.13	81.42	.35	.18	.62	-.45	96.0	220.3	221.5	211.2	212.4	39.6	32.9	N-S
D10	82.05	79.14	68.59	81.60	.02	.03	-.62	-.37	126.2	217.1	269.2	211.2	261.9	29.3	32.9	S-N
Avg.	81.57	78.60	68.36	81.51	.19	.11	.00	-.41	111.1	218.7	245.4	211.2	237.1	34.4	32.9	
Std Dv	.67	.76	.33	.13	.23	.11	.88	.06	21.4	2.3	33.7	.0	35.0	7.3	.0	
90% CI	3.00	3.41	1.45	.57	1.04	.47	3.91	.25	95.3	10.1	150.6	.0	156.3	32.5	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D11	82.14	79.11	68.29	81.21	.14	-.01	.88	-.04	105.3	218.4	226.4	211.2	218.9	36.5	28.8	N-S
D12	82.21	78.99	67.23	80.78	-.19	-.52	-.86	-.04	138.8	216.0	327.5	211.2	320.3	24.2	28.8	S-N
Avg.	82.18	79.05	67.76	80.99	-.02	-.26	.01	-.04	122.1	217.2	277.0	211.2	269.6	30.4	28.8	
Std Dv	.05	.08	.75	.30	.23	.36	1.23	.00	23.7	1.7	71.5	.0	71.7	8.7	.0	
90% CI	.22	.38	3.35	1.36	1.04	1.61	5.49	.00	105.8	7.6	319.2	.0	320.1	38.8	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D13	82.97	79.77	66.98	80.98	.28	.15	1.18	.45	97.1	221.3	223.0	211.2	212.8	34.0	24.7	N-S
D14	82.82	80.05	68.42	81.62	.42	.40	-1.16	.37	115.9	224.2	249.2	211.2	234.8	20.1	24.7	S-N
Avg.	82.89	79.91	67.70	81.30	.35	.28	.01	.41	106.5	222.8	236.1	211.2	223.8	27.0	24.7	
Std Dv	.11	.20	1.02	.45	.10	.18	1.65	.06	13.3	2.1	18.5	.0	15.6	9.8	.0	
90% CI	.47	.88	4.55	2.02	.44	.79	7.39	.25	59.4	9.2	82.7	.0	69.5	43.9	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department of Transportation

Volpe Center Acoustics Facility

April 19, 1993

TABLE B-F-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND RESONATOR STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKI'G DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B16	92.54	90.52	79.56	91.95	.11	-.36	.87	.00	129.3	121.1	156.4	118.9	153.6	26.2	21.1	N-S
B17	93.15	91.27	81.71	93.64	.11	.03	.62	.00	72.3	120.5	126.5	118.9	124.8	24.7	21.1	N-S
B18	93.05	91.31	82.81	94.90	-.19	-.21	1.01	.00	80.5	117.1	118.7	118.9	120.5	26.2	21.1	N-S
B20	93.18	91.23	82.17	94.31	-.42	-.51	.83	.00	76.0	114.9	118.5	118.9	122.5	24.7	21.1	N-S
B21	90.63	88.60	78.22	90.54	-.10	-.11	.70	.00	102.2	118.4	121.2	118.9	121.6	24.7	21.1	N-S
B22	92.19	90.56	80.79	92.96	-.45	-.42	.85	.00	85.4	114.4	114.8	118.9	119.3	24.7	21.1	N-S
B23	91.15	89.10	78.44	91.06	-.01	-.03	.75	.00	101.3	119.5	121.9	118.9	121.2	25.2	21.1	N-S
Avg.	92.27	90.37	80.53	92.77	-.14	-.23	.80	.00	92.4	118.0	125.4	118.9	126.2	25.2	21.1	
Std Dv	1.02	1.10	1.83	1.65	.23	.21	.13	.00	20.0	2.6	14.1	.0	12.2	.7	.0	
90% CI	.75	.81	1.34	1.21	.17	.15	.09	.00	14.7	1.9	10.4	.0	9.0	.5	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C24	87.91	83.33	73.23	88.07	-.40	-.35	.20	.00	115.7	108.6	120.5	111.0	123.1	21.1	20.6	N-S
C25	87.32	82.86	73.82	88.26	1.79	1.70	-.40	.00	102.9	133.8	137.3	111.0	113.8	22.6	20.6	N-S
C26	87.53	83.04	73.00	87.57	.82	.77	-.51	.00	100.1	121.7	123.6	111.0	112.7	20.1	20.6	N-S
C28	87.84	83.40	73.18	87.73	-.43	-.37	.43	.00	110.0	107.9	114.9	111.0	118.1	22.1	20.6	N-S
C29	87.34	82.71	72.12	86.77	.68	.52	-.13	.00	96.7	120.1	120.9	111.0	111.7	21.6	20.6	N-S
C30	87.43	82.88	73.64	88.49	.63	.61	-.01	.00	100.9	119.5	121.7	111.0	113.0	22.1	20.6	N-S
C31	87.01	82.42	72.67	87.31	.13	.13	-.22	.00	102.1	113.7	116.3	111.0	113.5	20.1	20.6	N-S
Avg.	87.48	82.95	73.09	87.74	.46	.43	-.09	.00	104.1	117.9	122.2	111.0	115.1	21.4	20.6	
Std Dv	.31	.34	.58	.59	.78	.72	.33	.00	6.5	8.9	7.3	.0	4.1	1.0	.0	
90% CI	.23	.25	.42	.43	.57	.53	.24	.00	4.8	6.6	5.4	.0	3.0	.7	.0	
150 m FLYOVER -- TARGET IAS 69.3 kts -- 0.9Vh																
A1	82.14	78.07	68.05	82.51	.01	-.17	.62	-.42	119.1	151.4	173.3	148.8	170.2	41.7	35.5	N-S
A2	82.08	77.99	68.77	83.16	.29	.26	-1.02	-.42	103.8	155.5	160.2	148.8	153.2	29.3	35.5	S-N
A3	81.73	77.81	68.71	83.01	.04	.02	.50	-.42	107.5	151.8	159.2	148.8	156.0	40.6	35.5	N-S
A4	81.63	77.49	68.77	83.16	.19	.24	-1.01	-.42	100.6	155.1	157.8	148.8	151.3	29.3	35.5	S-N
A6	81.48	77.36	68.55	82.94	.32	.29	-1.07	-.42	107.1	157.1	164.4	148.8	155.6	29.3	35.5	S-N
A7	81.56	77.67	68.59	82.90	.52	.53	.16	-.42	111.8	160.0	172.4	148.8	160.2	39.6	35.5	N-S
Avg.	81.77	77.73	68.57	82.95	.23	.19	-.30	-.42	108.3	155.2	164.6	148.8	157.8	35.0	35.5	
Std Dv	.28	.28	.27	.24	.19	.24	.81	.00	6.5	3.2	6.8	.0	6.8	6.2	.0	
90% CI	.23	.23	.22	.20	.16	.20	.67	.00	5.3	2.7	5.6	.0	5.6	5.1	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-F-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND RESONATOR
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 77.0 kts -- 1.0Vh																
D8	81.77	77.75	69.07	83.76	.37	.38	-1.05	-.68	98.8	157.6	159.5	148.8	150.5	32.9	39.6	S-N
D9	81.85	77.62	68.84	83.84	.27	-.32	.31	-.68	71.4	154.9	163.4	148.8	157.0	44.2	39.6	N-S
Avg.	81.81	77.68	68.96	83.80	.32	.03	-.37	-.68	85.1	156.3	161.4	148.8	153.8	38.6	39.6	
Std Dv	.06	.09	.16	.06	.07	.49	.96	.00	19.4	1.9	2.8	.0	4.6	8.0	.0	
90% CI	.25	.41	.73	.25	.32	2.21	4.29	.00	86.5	8.5	12.3	.0	20.5	35.7	.0	
150 m FLYOVER -- TARGET IAS 61.6 kts -- 0.8Vh																
D10	82.45	78.17	68.59	83.12	.81	.65	-1.26	-.19	78.7	163.3	166.5	148.8	151.7	26.2	31.9	S-N
D11	81.97	78.11	68.43	82.72	.26	.23	.60	-.23	100.9	154.9	157.7	148.8	151.5	38.1	31.9	N-S
Avg.	82.21	78.14	68.51	82.92	.53	.44	-.33	-.21	89.8	159.1	162.1	148.8	151.6	32.2	31.9	
Std Dv	.34	.04	.11	.28	.39	.30	1.32	.03	15.7	5.9	6.2	.0	.1	8.4	.0	
90% CI	1.52	.19	.51	1.26	1.74	1.33	5.87	.13	70.1	26.5	27.8	.0	.6	37.6	.0	
150 m FLYOVER -- TARGET IAS 53.9 kts -- 0.7Vh																
D12	82.71	78.45	68.75	82.98	.50	.46	-1.27	-.04	101.4	158.6	161.8	148.8	151.8	22.1	27.8	S-N
D13	82.77	78.95	68.42	82.49	-.05	-.09	.91	-.04	110.3	149.8	159.7	148.8	158.5	34.5	27.8	N-S
Avg.	82.74	78.70	68.58	82.74	.22	.19	-.18	-.04	105.9	154.2	160.8	148.8	155.1	28.3	27.8	
Std Dv	.04	.35	.23	.35	.39	.39	1.54	.00	6.3	6.2	1.5	.0	4.7	8.8	.0	
90% CI	.19	1.58	1.04	1.55	1.74	1.74	6.88	.00	28.1	27.8	6.6	.0	21.2	39.1	.0	
150 m FLYOVER -- TARGET IAS 46.2 kts -- 0.6Vh																
D14	83.50	79.20	68.67	82.78	.66	.52	-1.53	.21	103.8	160.7	165.4	148.8	153.1	18.0	23.7	S-N
D15	83.73	79.78	68.83	82.97	.55	.33	.72	.21	116.1	159.2	177.3	148.8	165.7	29.8	23.7	N-S
Avg.	83.61	79.49	68.75	82.88	.61	.43	-.41	.21	109.9	159.9	171.4	148.8	159.4	23.9	23.7	
Std Dv	.16	.41	.11	.13	.08	.13	1.59	.00	8.7	1.1	8.4	.0	8.9	8.3	.0	
90% CI	.73	1.83	.51	.60	.35	.60	7.10	.00	38.8	4.7	37.6	.0	39.8	37.3	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-F-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND RESONATOR
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B16	86.73	84.81	73.59	85.86	.20	.12	.83	.00	116.0	196.1	218.2	191.0	212.5	26.2	21.1	N-S
B17	88.35	86.61	76.48	88.20	.21	.10	.57	.00	67.1	195.7	212.4	191.0	207.3	24.7	21.1	N-S
B18	87.21	85.48	74.88	86.84	.03	.00	.89	.00	75.2	193.5	200.1	191.0	197.5	26.2	21.1	N-S
B20	87.57	86.00	75.36	86.58	-.44	-.39	.79	.00	62.5	186.1	209.9	191.0	215.3	24.7	21.1	N-S
B21	86.67	85.02	74.30	85.48	.02	.02	.58	.00	44.9	195.4	277.0	191.0	270.7	24.7	21.1	N-S
B22	86.29	84.65	75.64	86.97	-.08	-.07	.64	.00	56.2	192.6	231.8	191.0	229.8	24.7	21.1	N-S
B23	85.50	83.58	71.82	83.94	.03	-.02	.71	.00	88.1	193.5	193.6	191.0	191.1	25.2	21.1	N-S
Avg.	86.90	85.16	74.58	86.27	-.00	-.03	.72	.00	72.9	193.3	220.4	191.0	217.7	25.2	21.1	
Std Dv	.92	.98	1.53	1.35	.22	.17	.13	.00	23.4	3.4	27.8	.0	26.5	.7	.0	
90% CI	.67	.72	1.13	.99	.16	.13	.09	.00	17.2	2.5	20.4	.0	19.5	.5	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C24	84.84	81.02	70.44	84.79	-.04	-.10	.07	.00	104.1	187.0	192.8	185.5	191.2	21.1	20.6	N-S
C25	85.42	81.12	70.99	85.83	.66	.55	.09	.00	107.3	199.5	209.0	185.5	194.3	22.6	20.6	N-S
C26	84.64	80.94	70.20	84.93	.12	.04	-.20	.00	104.8	189.4	195.9	185.5	191.8	20.1	20.6	N-S
C28	85.18	81.24	70.56	84.55	-.10	-.73	.30	.00	109.5	185.7	196.9	185.5	196.7	22.1	20.6	N-S
C29	84.88	81.41	70.18	83.47	.21	.14	.08	.00	96.2	190.9	192.0	185.5	186.5	21.6	20.6	N-S
C30	84.92	80.55	69.54	84.14	.20	-.66	.19	.00	111.1	190.5	204.1	185.5	198.7	22.1	20.6	N-S
C31	84.15	80.30	69.48	83.84	-.03	-.06	-.15	.00	99.4	187.0	189.6	185.5	188.0	20.1	20.6	N-S
Avg.	84.86	80.94	70.20	84.51	.15	-.12	.05	.00	104.6	190.0	197.2	185.5	192.5	21.4	20.6	
Std Dv	.40	.39	.54	.78	.26	.45	.18	.00	5.3	4.6	7.0	.0	4.4	1.0	.0	
90% CI	.30	.29	.40	.57	.19	.33	.13	.00	3.9	3.4	5.1	.0	3.3	.7	.0	
150 m FLYOVER -- TARGET IAS 69.3 kts -- 0.9Vh																
A1	81.06	78.66	67.38	79.96	.14	.10	.54	-.93	44.3	219.0	313.7	211.2	302.5	41.7	35.5	N-S
A2	81.08	78.77	67.12	81.80	.25	-.03	-1.00	-.87	62.2	219.6	248.2	211.2	238.7	29.3	35.5	S-N
A3	80.41	77.86	67.81	79.73	-.15	-.23	.55	-.93	95.5	213.4	214.4	211.2	212.2	40.6	35.5	N-S
A4	80.85	77.50	67.55	82.42	.38	.04	-1.05	-.87	63.4	222.2	248.4	211.2	236.1	29.3	35.5	S-N
A6	81.08	77.84	67.46	82.31	.36	.21	-1.05	-.93	61.5	222.0	252.5	211.2	240.3	29.3	35.5	S-N
A7	79.79	77.49	67.93	79.51	.05	-.10	.33	-.87	100.0	218.9	222.2	211.2	214.5	39.6	35.5	N-S
Avg.	80.71	77.85	67.54	80.96	.17	-.00	-.28	-.90	71.2	219.2	249.9	211.2	240.7	35.0	35.5	
Std Dv	.52	.43	.29	1.36	.20	.15	.83	.03	21.8	3.2	35.0	.0	32.7	6.2	.0	
90% CI	.43	.35	.24	1.12	.17	.13	.68	.03	17.9	2.6	28.8	.0	26.9	5.1	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-F-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND RESONATOR
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 77.0 kts -- 0.9Vh																
D8	81.07	77.96	69.22	82.90	.43	.19	-1.07	-1.18	56.0	224.6	270.9	211.2	254.8	32.9	39.6	S-N
D9	80.50	77.64	68.92	81.33	.07	-.50	.37	-1.60	47.0	216.6	296.0	211.2	288.7	44.2	39.6	N-S
Avg.	80.79	77.80	69.07	82.12	.25	-.16	-.35	-1.39	51.5	220.6	283.5	211.2	271.8	38.6	39.6	
Std Dv	.40	.23	.21	1.11	.25	.49	1.02	.30	6.4	5.7	17.7	.0	24.0	8.0	.0	
90% CI	1.80	1.01	.95	4.96	1.14	2.18	4.55	1.33	28.4	25.3	79.2	.0	107.0	35.7	.0	
150 m FLYOVER -- TARGET IAS 61.6 kts -- 0.8Vh																
D10	81.18	77.68	66.82	81.38	.60	.18	-1.17	-.58	60.0	227.6	262.8	211.2	243.9	26.2	31.9	S-N
D11	80.02	77.28	66.84	78.82	-.14	-.46	.71	-.43	101.2	214.3	218.4	211.2	215.3	38.1	31.9	N-S
Avg.	80.60	77.48	66.83	80.10	.23	-.14	-.23	-.50	80.6	221.0	240.6	211.2	229.6	32.2	31.9	
Std Dv	.82	.28	.01	1.81	.52	.45	1.33	.11	29.1	9.4	31.4	.0	20.2	8.4	.0	
90% CI	3.66	1.26	.06	8.08	2.34	2.02	5.94	.47	130.1	42.0	140.2	.0	90.3	37.6	.0	
150 m FLYOVER -- TARGET IAS 53.9 kts -- 0.7Vh																
D12	81.14	77.77	66.27	81.17	.53	.04	-1.27	-.52	62.4	225.4	254.5	211.2	238.4	22.1	27.8	S-N
D13	80.92	78.09	66.45	78.39	-.07	-.51	.83	.09	121.4	216.4	253.5	211.2	247.4	34.5	27.8	N-S
Avg.	81.03	77.93	66.36	79.78	.23	-.23	-.22	-.21	91.9	220.9	254.0	211.2	242.9	28.3	27.8	
Std Dv	.16	.23	.13	1.97	.42	.39	1.48	.43	41.7	6.4	.7	.0	6.4	8.8	.0	
90% CI	.69	1.01	.57	8.78	1.89	1.74	6.63	1.93	186.3	28.4	3.2	.0	28.4	39.1	.0	
150 m FLYOVER -- TARGET IAS 46.2 kts -- 0.6Vh																
D14	81.28	77.26	65.30	80.27	.38	-.32	-1.43	-.29	60.3	223.1	256.9	211.2	243.2	18.0	23.7	S-N
D15	82.26	79.47	66.72	79.59	.31	-.06	.79	.78	104.8	222.4	230.0	211.2	218.4	29.8	23.7	N-S
Avg.	81.77	78.37	66.01	79.93	.34	-.19	-.32	.24	82.6	222.8	243.4	211.2	230.8	23.9	23.7	
Std Dv	.69	1.56	1.00	.48	.05	.18	1.57	.76	31.5	.5	19.0	.0	17.5	8.3	.0	
90% CI	3.09	6.98	4.48	2.15	.22	.82	7.01	3.38	140.5	2.2	84.9	.0	78.3	37.3	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

April 19, 1993

U.S. Department of Transportation
Volpe Center
Acoustics Facility

TABLE B-F-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND RESONATOR STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B16	87.48	85.40	72.05	84.92	-.17	-.28	1.01	.00	122.8	188.5	224.3	191.0	227.2	26.2	21.1	N-S
B17	86.72	84.38	72.04	84.58	-.20	-.29	.75	.00	91.9	188.1	188.2	191.0	191.1	24.7	21.1	N-S
B18	86.43	84.23	71.31	84.14	-.36	-.38	1.06	.00	113.3	186.2	202.8	191.0	208.0	26.2	21.1	N-S
B20	86.82	83.73	70.78	84.20	-.08	-.52	.68	.00	114.9	191.0	210.6	191.0	210.5	24.7	21.1	N-S
B21	85.67	83.34	71.09	83.25	-.43	-.40	.80	.00	92.8	185.8	186.1	191.0	191.2	24.7	21.1	N-S
B22	85.08	82.98	70.19	82.61	-.53	-.49	.85	.00	85.9	183.8	184.3	191.0	191.5	24.7	21.1	N-S
B23	86.36	84.25	72.04	83.34	-.39	-.51	.81	.00	36.4	189.2	319.0	191.0	321.9	25.2	21.1	N-S
Avg.	86.37	84.04	71.36	83.86	-.31	-.41	.85	.00	94.0	187.5	216.5	191.0	220.2	25.2	21.1	
Std Dv	.79	.79	.73	.82	.16	.10	.14	.00	28.9	2.4	47.5	.0	46.8	.7	.0	
90% CI	.58	.58	.53	.60	.12	.07	.10	.00	21.3	1.8	34.9	.0	34.4	.5	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C24	85.83	81.88	70.38	84.36	-.51	-.45	.21	.00	84.6	181.1	181.9	185.5	186.3	21.1	20.6	N-S
C25	86.09	82.09	70.70	85.16	.57	.52	.09	.00	63.4	199.5	223.2	185.5	207.4	22.6	20.6	N-S
C26	86.00	81.58	69.96	84.46	-.02	-.63	-.20	.00	74.7	189.4	196.4	185.5	192.2	20.1	20.6	N-S
C28	86.13	82.37	70.48	84.32	-.47	-.80	.40	.00	86.1	181.7	182.1	185.5	185.9	22.1	20.6	N-S
C29	86.42	82.55	70.58	85.32	.09	-.11	.08	.00	73.5	190.9	199.1	185.5	193.4	21.6	20.6	N-S
C30	86.30	82.09	69.60	84.58	.06	-.56	.19	.00	60.6	190.5	218.6	185.5	212.8	22.1	20.6	N-S
C31	85.08	81.34	69.27	83.20	-.11	-.08	-.15	.00	80.9	187.0	189.5	185.5	187.8	20.1	20.6	N-S
Avg.	85.98	81.99	70.14	84.49	-.06	-.30	.09	.00	74.8	188.6	198.7	185.5	195.1	21.4	20.6	
Std Dv	.44	.42	.54	.69	.37	.45	.21	.00	10.0	6.3	16.6	.0	10.7	1.0	.0	
90% CI	.32	.31	.40	.51	.27	.33	.15	.00	7.3	4.6	12.2	.0	7.9	.7	.0	
150 m FLYOVER -- TARGET IAS 69.3 kts -- 0.9Vh																
A1	81.34	77.77	67.01	80.68	-.45	-1.20	.79	-.87	49.2	207.0	273.5	211.2	279.0	41.7	35.5	N-S
A2	80.65	78.17	67.99	80.65	-.29	-.19	-.85	-.93	106.5	212.4	221.5	211.2	220.2	29.3	35.5	S-N
A3	80.59	77.97	68.40	80.87	-.23	-.14	.55	-.87	84.7	213.4	214.3	211.2	212.1	40.6	35.5	N-S
A4	80.37	77.88	67.83	80.28	-.45	-.35	-.79	-.93	96.7	209.1	210.5	211.2	212.7	29.3	35.5	S-N
A6	80.57	77.86	68.10	80.24	-.29	-.42	-.85	-.87	101.6	212.3	216.7	211.2	215.6	29.3	35.5	S-N
A7	81.11	76.88	67.00	80.71	.16	-1.38	.31	-.93	49.5	219.7	289.0	211.2	277.9	39.6	35.5	N-S
Avg.	80.77	77.76	67.72	80.57	-.26	-.61	-.14	-.90	81.4	212.3	237.6	211.2	236.3	35.0	35.5	
Std Dv	.37	.45	.59	.25	.22	.54	.77	.03	25.8	4.3	34.4	.0	32.8	6.2	.0	
90% CI	.30	.37	.48	.21	.18	.44	.63	.03	21.3	3.6	28.3	.0	27.0	5.1	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-F-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND RESONATOR
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3   SIDELINE - 150 m EAST   07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	---
150 m FLYOVER -- TARGET IAS 77.0 kts -- 1.0Vh																
D8	80.37	78.03	69.43	81.71	-.36	-.28	-.78	-1.60	86.3	210.3	210.7	211.2	211.6	32.9	39.6	S-N
D9	81.57	78.55	69.01	82.52	-.09	-.39	.41	-1.18	46.8	214.5	294.1	211.2	289.6	44.2	39.6	N-S
Avg.	80.97	78.29	69.22	82.11	-.23	-.33	-.19	-1.39	66.6	212.4	252.4	211.2	250.6	38.6	39.6	
Std Dv	.85	.37	.30	.57	.19	.08	.84	.30	27.9	3.0	59.0	.0	55.2	8.0	.0	
90% CI	3.79	1.64	1.33	2.56	.85	.35	3.76	1.33	124.7	13.3	263.3	.0	246.2	35.7	.0	
150 m FLYOVER -- TARGET IAS 61.6 kts -- 0.8Vh																
D10	80.74	78.00	67.48	79.77	-.07	-.09	-.94	-.34	97.8	215.7	217.6	211.2	213.2	26.2	31.9	S-N
D11	80.65	77.65	67.42	79.70	-.06	-.18	.66	-.66	76.3	216.8	223.2	211.2	217.4	38.1	31.9	N-S
Avg.	80.69	77.82	67.45	79.74	-.06	-.14	-.14	-.50	87.1	216.3	220.4	211.2	215.3	32.2	31.9	
Std Dv	.06	.25	.04	.05	.01	.06	1.13	.23	15.2	.8	4.0	.0	3.0	8.4	.0	
90% CI	.28	1.10	.19	.22	.03	.28	5.05	1.01	67.9	3.5	17.7	.0	13.3	37.6	.0	
150 m FLYOVER -- TARGET IAS 53.9 kts -- 0.7Vh																
D12	81.22	78.63	67.12	79.81	-.38	-.26	-.98	.09	108.9	210.8	222.8	211.2	223.3	22.1	27.8	S-N
D13	81.22	78.30	67.06	79.37	-.54	-.69	1.02	-.52	80.2	207.4	210.5	211.2	214.4	34.5	27.8	N-S
Avg.	81.22	78.46	67.09	79.59	-.46	-.47	.02	-.21	94.6	209.1	216.6	211.2	218.9	28.3	27.8	
Std Dv	.00	.23	.04	.31	.11	.30	1.41	.43	20.3	2.4	8.7	.0	6.3	8.8	.0	
90% CI	3.00	1.04	.19	1.39	.51	1.36	6.31	1.93	90.6	10.7	38.8	.0	28.1	39.1	.0	
150 m FLYOVER -- TARGET IAS 46.2 kts -- 0.6Vh																
D14	82.25	79.35	67.31	80.35	-.07	.01	-1.30	.78	101.9	216.5	221.2	211.2	215.8	18.0	23.7	S-N
D15	81.39	77.94	66.26	79.22	-.14	-.52	.93	-.29	98.0	214.9	217.0	211.2	213.3	29.8	23.7	N-S
Avg.	81.82	78.65	66.79	79.79	-.11	-.25	-.19	.24	99.9	215.7	219.1	211.2	214.6	23.9	23.7	
Std Dv	.61	1.00	.74	.80	.05	.37	1.58	.76	2.8	1.1	3.0	.0	1.8	8.3	.0	
90% CI	2.72	4.45	3.31	3.57	.22	1.67	7.04	3.38	12.3	5.1	13.3	.0	7.9	37.3	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation
Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-G-1-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B16	91.82	89.41	80.26	92.45	.21	-.04	.49	.00	76.0	120.9	124.7	118.2	121.8	24.2	21.1	N-S
B17	91.94	89.50	79.71	92.14	-.27	-.95	.60	.00	72.3	115.5	121.2	118.2	124.1	23.7	21.1	N-S
B19	92.82	90.77	81.71	93.91	.13	-.07	.70	.00	93.5	117.6	117.9	118.2	118.4	24.7	21.1	N-S
B20	90.13	87.83	78.56	89.34	-.61	-.58	1.02	.00	45.8	111.6	155.7	118.2	165.0	25.2	21.1	N-S
B21	91.55	88.74	78.00	90.10	.02	-.93	.60	.00	61.7	117.9	133.9	118.2	134.3	24.2	21.1	N-S
B24	92.36	90.63	81.81	94.03	-.10	-.16	.38	.00	100.7	116.4	118.5	118.2	120.3	22.6	21.1	N-S
Avg.	91.77	89.48	80.01	91.99	-.10	-.46	.63	.00	75.0	116.7	128.7	118.2	130.6	24.1	21.1	
Std Dv	.92	1.12	1.58	1.93	.30	.42	.22	.00	20.2	3.1	14.5	.0	17.7	.9	.0	
90% CI	.76	.92	1.30	1.59	.25	.35	.18	.00	16.6	2.5	11.9	.0	14.6	.7	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C25	87.67	83.68	73.52	87.68	-.82	-.79	.56	.00	107.9	100.8	105.9	109.1	114.7	21.6	20.6	N-S
C26	87.50	83.54	73.51	87.65	1.89	1.82	-.52	.00	116.6	132.2	147.8	109.1	122.0	22.1	20.6	N-S
C27	88.66	84.18	72.85	87.64	1.40	.78	-.51	.00	80.8	125.9	127.5	109.1	110.5	21.1	20.6	N-S
C28	88.01	84.21	72.98	87.07	.53	.50	.17	.00	98.3	115.4	116.6	109.1	110.2	22.6	20.6	N-S
C29	88.25	84.46	74.34	88.33	2.31	2.19	-.81	.00	91.7	137.9	138.0	109.1	109.1	21.6	20.6	N-S
C30	87.45	83.65	73.59	87.75	.14	.12	-.07	.00	113.1	110.9	120.7	109.1	118.7	20.6	20.6	N-S
Avg.	87.92	83.95	73.47	87.69	.91	.77	-.20	.00	101.4	120.5	126.1	109.1	114.2	21.6	20.6	
Std Dv	.47	.38	.53	.40	1.17	1.10	.51	.00	13.7	14.0	15.1	.0	5.2	.7	.0	
90% CI	.39	.31	.44	.33	.97	.90	.42	.00	11.3	11.5	12.4	.0	4.3	.6	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A2	83.58	79.70	70.49	84.99	.14	.12	-.35	-.33	101.5	152.1	155.2	148.8	151.8	35.0	37.0	S-N
A3	83.64	79.97	71.08	85.53	-.01	-.01	.26	-.40	108.8	150.0	158.5	148.8	157.2	39.6	37.0	N-S
A4	83.19	79.38	70.54	85.17	-.15	-.15	-.35	-.33	101.8	147.8	151.0	148.8	151.9	34.0	37.0	S-N
A5	84.10	80.15	71.07	86.01	.45	.43	.12	-.28	81.7	156.7	158.3	148.8	150.3	40.1	37.0	N-S
A6	83.34	79.59	70.00	84.62	.23	.05	-.51	-.28	99.9	153.3	155.7	148.8	151.0	34.0	37.0	S-N
A7	83.79	80.23	70.49	84.94	-.04	-.05	.44	-.28	95.1	149.4	150.0	148.8	149.3	41.2	37.0	N-S
Avg.	83.61	79.84	70.61	85.21	.10	.06	-.06	-.32	98.1	151.6	154.8	148.8	151.9	37.3	37.0	
Std Dv	.32	.33	.41	.49	.22	.20	.39	.05	9.2	3.2	3.6	.0	2.8	3.3	.0	
90% CI	.27	.27	.34	.41	.18	.17	.32	.04	7.5	2.6	3.0	.0	2.3	2.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

TABLE B-G-1-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D8	83.29	79.39	70.62	84.94	-.09	-.14	-.39	-.04	96.6	148.4	149.4	148.8	149.7	37.6	41.2	S-N
D9	83.75	79.72	71.02	85.42	.56	.37	.04	-.24	108.8	158.2	167.1	148.8	157.2	44.2	41.2	N-S
Avg.	83.52	79.56	70.82	85.18	.23	.12	-.18	-.14	102.7	153.3	158.3	148.8	153.4	40.9	41.2	
Std Dv	.33	.23	.28	.34	.46	.36	.30	.14	8.6	6.9	12.5	.0	5.3	4.7	.0	
90% CI	1.45	1.04	1.26	1.52	2.05	1.61	1.36	.63	38.5	30.9	55.9	.0	23.7	20.8	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D10	82.85	79.36	69.75	84.16	.09	.07	-.42	-.18	98.8	151.2	153.0	148.8	150.5	30.3	32.9	S-N
D11	83.96	80.32	70.02	84.05	-.12	-.12	.29	-.23	98.3	147.8	149.4	148.8	150.3	35.0	32.9	N-S
Avg.	83.40	79.84	69.88	84.11	-.01	-.02	-.06	-.21	98.6	149.5	151.2	148.8	150.4	32.7	32.9	
Std Dv	.78	.68	.19	.08	.15	.13	.50	.04	.4	2.4	2.5	.0	.1	3.3	.0	
90% CI	3.50	3.03	.85	.35	.66	.60	2.24	.16	1.6	10.7	11.4	.0	.6	14.8	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D12	83.86	80.16	70.24	84.27	-.40	-.38	-.44	-.11	95.5	144.0	144.7	148.8	149.4	25.2	28.8	S-N
D13	83.45	79.59	69.25	83.76	.05	.03	.32	-.14	91.5	150.3	150.4	148.8	148.8	31.4	28.8	N-S
Avg.	83.65	79.88	69.74	84.01	-.17	-.17	-.06	-.13	93.5	147.1	147.5	148.8	149.1	28.3	28.8	
Std Dv	.29	.40	.70	.36	.32	.29	.54	.02	2.8	4.5	4.0	.0	.4	4.4	.0	
90% CI	1.29	1.80	3.13	1.61	1.42	1.29	2.40	.09	12.6	19.9	18.0	.0	1.9	19.6	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D14	84.39	80.35	69.97	84.19	.27	.23	-.51	-.13	87.3	153.4	153.6	148.8	148.9	22.6	24.7	S-N
D15	84.63	80.61	70.34	84.27	.08	.03	.46	-.13	99.9	150.6	152.9	148.8	151.0	27.8	24.7	N-S
Avg.	84.51	80.48	70.15	84.23	.18	.13	-.03	-.13	93.6	152.0	153.3	148.8	149.9	25.2	24.7	
Std Dv	.17	.18	.26	.06	.13	.14	.69	.00	8.9	2.0	.5	.0	1.5	3.7	.0	
90% CI	.76	.82	1.17	.25	.60	.63	3.06	.00	39.8	8.8	2.2	.0	6.6	16.4	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

TABLE B-G-2-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND DIRECTED EXHAUST
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B16	85.21	83.14	72.25	84.43	.06	.03	.55	.00	93.9	192.7	193.1	191.0	191.4	24.2	21.1	N-S
B17	86.29	84.66	76.21	87.72	-.11	-.15	.54	.00	61.5	189.3	215.4	191.0	217.3	23.7	21.1	N-S
B19	85.48	83.46	73.22	85.06	.01	-.18	.65	.00	94.2	192.3	192.8	191.0	191.5	24.7	21.1	N-S
B20	86.09	84.37	74.87	86.60	-.22	-.19	.83	.00	50.9	188.4	242.6	191.0	245.9	25.2	21.1	N-S
B21	85.20	83.78	72.67	83.60	-.06	-.06	.59	.00	73.7	190.8	198.7	191.0	198.9	24.2	21.1	N-S
B24	86.58	84.16	73.69	85.51	-.12	-.98	.34	.00	108.2	189.6	199.6	191.0	201.1	22.6	21.1	N-S
Avg.	85.81	83.93	73.82	85.49	-.07	-.25	.58	.00	80.4	190.5	207.0	191.0	207.7	24.1	21.1	
Std Dv	.59	.57	1.48	1.49	.10	.36	.16	.00	22.0	1.7	19.3	.0	21.0	.9	.0	
90% CI	.49	.47	1.22	1.22	.08	.30	.13	.00	18.1	1.4	15.9	.0	17.3	.7	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C25	84.73	81.19	69.83	83.49	-.19	-.48	.26	.00	101.8	183.2	187.1	185.5	189.4	21.6	20.6	N-S
C26	84.47	81.39	70.21	83.93	.33	.62	-.02	.00	101.4	199.9	203.9	185.5	189.2	22.1	20.6	N-S
C27	84.78	81.76	70.82	85.11	.54	.49	-.13	.00	104.3	195.8	202.1	185.5	191.4	21.1	20.6	N-S
C28	84.54	79.75	68.61	83.28	.16	-1.05	.32	.00	100.3	189.2	192.3	185.5	188.5	22.6	20.6	N-S
C29	84.25	80.54	69.13	83.78	1.11	1.00	-.25	.00	104.7	206.4	213.4	185.5	191.7	21.6	20.6	N-S
C30	83.90	80.53	69.38	83.19	.15	.09	-.08	.00	93.7	189.0	189.4	185.5	185.8	20.6	20.6	N-S
Avg.	84.44	80.86	69.66	83.80	.35	.11	.02	.00	101.0	193.9	198.0	185.5	189.3	21.6	20.6	
Std Dv	.33	.73	.79	.70	.44	.76	.23	.00	4.0	8.4	10.1	.0	2.1	.7	.0	
90% CI	.27	.60	.65	.58	.36	.63	.19	.00	3.3	6.9	8.3	.0	1.8	.6	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A2	81.73	78.66	68.57	82.08	-.03	-.18	-.29	-.54	57.4	213.4	253.2	211.2	250.6	35.0	37.0	S-N
A3	81.01	78.56	70.66	82.35	-.13	-.09	.27	-.75	96.5	212.3	213.7	211.2	212.6	39.6	37.0	N-S
A4	81.64	78.65	68.32	82.05	-.17	-.21	-.37	-.54	54.6	210.8	258.6	211.2	259.1	34.0	37.0	S-N
A5	81.60	78.08	68.40	80.61	.05	-.89	.26	-.50	62.3	215.8	243.7	211.2	238.5	40.1	37.0	N-S
A6	81.74	78.41	68.82	82.61	-.08	-.34	-.41	-.45	57.5	212.8	252.2	211.2	250.4	34.0	37.0	S-N
A7	81.59	78.55	68.66	81.09	-.09	-.37	.45	-.50	97.2	211.6	213.3	211.2	212.9	41.2	37.0	N-S
Avg.	81.55	78.48	68.91	81.80	-.07	-.35	-.02	-.55	70.9	212.8	239.1	211.2	237.4	37.3	37.0	
Std Dv	.27	.22	.88	.78	.08	.29	.38	.11	20.2	1.7	20.4	.0	20.2	3.3	.0	
90% CI	.22	.18	.72	.64	.06	.24	.31	.09	16.7	1.4	16.8	.0	16.6	2.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-G-2-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND DIRECTED EXHAUST
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D8	82.94	79.96	71.08	83.69	-.17	-.12	-.38	- [illegible]5	87.8	210.4	210.5	211.2	211.4	37.6	41.2	S-N
D9	81.72	79.23	69.16	81.12	.21	.21	.17	-.52	107.3	218.2	228.6	211.2	221.3	44.2	41.2	N-S
Avg.	82.33	79.60	70.12	82.40	.02	.04	-.10	-.29	97.6	214.3	219.6	211.2	216.4	40.9	41.2	
Std Dv	.86	.52	1.36	1.82	.27	.23	.39	.33	13.8	5.5	12.8	.0	7.0	4.7	.0	
90% CI	3.85	2.30	6.06	8.11	1.20	1.04	1.74	1.45	61.6	24.6	57.1	.0	31.3	20.[illegible]	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D10	81.70	78.17	67.76	82.63	.00	-.36	-.38	-.32	54.3	212.7	262.1	211.2	260.2	30.3	32.9	S-N
D11	81.85	78.56	66.89	80.12	-.30	-.87	.31	-.25	48.5	208.8	278.6	211.2	281.8	35.0	32.9	N-S
Avg.	81.77	78.36	67.32	81.38	-.15	-.62	-.03	-.28	51.4	210.8	270.4	211.2	271.0	32.7	32.9	
Std Dv	.11	.28	.62	1.77	.21	.36	.49	.05	4.1	2.8	11.7	.0	15.3	3.3	.0	
90% CI	.47	1.23	2.75	7.92	.95	1.61	2.18	.22	18.3	12.3	52.1	.0	68.2	14.8	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D12	81.71	78.66	67.59	81.41	-.50	-.55	-.41	-.22	62.5	203.2	229.1	211.2	238.1	25.2	28.8	S-N
D13	81.56	78.92	67.88	79.88	-.19	-.18	.41	.04	89.7	209.5	209.5	211.2	211.2	31.4	28.8	N-S
Avg.	81.63	78.79	67.74	80.65	-.34	-.37	.00	-.09	76.1	206.4	219.3	211.2	224.6	28.3	28.8	
Std Dv	.11	.18	.21	1.08	.22	.26	.58	.18	19.2	4.5	13.9	.0	19.0	4.4	.0	
90% CI	.47	.82	.92	4.83	.98	1.17	2.59	.82	85.9	19.9	61.9	.0	84.9	19.6	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D14	82.23	78.82	66.72	81.57	.30	.25	-.53	-.30	59.9	218.8	252.9	211.2	244.2	22.6	24.7	S-N
D15	82.18	79.26	68.21	81.14	-.10	-.20	.53	.35	95.8	210.4	211.5	211.2	212.3	27.8	24.7	N-S
Avg.	82.21	79.04	67.46	81.35	.10	.02	.00	.02	77.9	214.6	232.2	211.2	228.3	25.2	24.7	
Std Dv	.04	.31	1.05	.30	.28	.32	.75	.46	25.4	5.9	29.3	.0	22.6	3.7	.0	
90% CI	.16	1.39	4.70	1.36	1.26	1.42	3.35	2.05	113.3	26.5	130.7	.0	100.7	16.4	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-G-3-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND DIRECTED EXHAUST
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 40.8 kts																
B16	85.52	82.62	71.32	84.65	.12	-.28	.55	.00	72.9	192.7	201.5	191.0	199.8	24.2	21.1	N-S
B17	85.02	82.73	70.65	82.89	-.11	-.18	.54	.00	92.0	189.3	189.4	191.0	191.1	23.7	21.1	N-S
B19	86.13	83.74	70.89	83.37	-.12	-.78	.73	.00	65.5	188.9	207.6	191.0	209.9	24.7	21.1	N-S
B20	84.55	82.02	69.84	82.31	-.36	-.76	.90	00	71.8	185.4	195.2	191.0	201.0	25.2	21.1	N-S
B21	85.89	83.60	70.61	83.90	-.03	-.58	[illegible]	.00	67.1	190.8	207.1	191.0	207.3	24.2	21.1	N-S
B24	85.79	83.01	71.35	84.49	-.08	-.53	[illegible]	[illegible]	113.9	190.1	208.0	191.0	208.9	22.6	21.1	N-S
Avg.	85.48	82.95	70.78	83.60	-.10	-.52	.61	[illegible]	80.5	189.5	201.5	191.0	203.0	24.1	21.1	
Std Dv	.59	.64	.56	.92	.16	.25	.19	.00	18.9	2.4	7.7	.0	7.2	.9	.0	
90% CI	.49	.53	.46	.75	.13	.20	.16	.00	15.5	2.0	6.3	.0	5.9	.7	.0	
TAKEOFF -- TARGET IAS 40.8 kts																
C25	85.44	82.24	70.98	84.66	-.54	-.48	.39	.00	84.9	178.1	178.8	185.5	186.2	21.6	20.6	N-S
C26	85.93	82.41	71.11	84.53	.77	.69	-.02	.00	88.8	199.9	199.9	185.5	185.5	22.1	20.6	N-S
C27	86.10	82.54	71.37	85.74	.57	.40	-.13	.00	79.7	195.8	199.0	185.5	188.5	21.1	20.6	N-S
C28	85.70	82.28	71.79	85.44	.19	.14	.32	.00	83.1	189.2	190.6	185.5	186.8	22.6	20.6	N-S
C29	85.92	82.12	69.76	83.69	.90	.50	-.14	.00	56.2	201.0	241.8	185.5	223.1	21.6	20.6	N-S
C30	85.33	81.93	70.12	82.64	-.16	-.13	.03	.00	109.1	184.1	194.8	185.5	196.3	20.6	20.6	N-S
Avg.	85.74	82.25	70.86	84.45	.29	.19	.07	.00	83.6	191.3	200.8	185.5	194.4	21.6	20.6	
Std Dv	.30	.21	.77	1.14	.56	.43	.23	.00	17.0	9.2	21.5	.0	14.6	.7	.0	
90% CI	.25	.18	.63	.94	.46	.36	.19	.00	14.0	7.5	17.7	.0	12.0	.6	.0	
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh																
A2	81.39	79.21	70.10	82.05	.00	.00	-.30	-.61	92.0	213.8	213.9	211.2	211.4	35.0	37.0	S-N
A3	81.86	79.32	69.43	82.89	-.13	-.16	.28	-.63	43.5	211.9	308.0	211.2	307.1	39.6	37.0	N-S
A4	81.20	78.88	69.27	81.08	-.16	-.23	-.36	-.61	92.2	210.4	210.5	211.2	211.4	34.0	37.0	S-N
A5	82.58	79.72	70.23	82.23	.15	.20	.21	-.45	87.4	217.9	218.2	211.2	211.4	40.1	37.0	N-S
A6	81.61	78.66	68.98	81.28	.12	-.50	-.48	-.50	51.6	216.2	275.9	211.2	269.6	34.0	37.0	S-N
A7	82.18	78.96	69.06	81.97	-.06	-.39	.45	-.45	69.8	211.6	225.5	211.2	225.1	41.2	37.0	N-S
Avg.	81.80	79.13	69.51	81.92	-.01	-.18	-.03	-.54	72.8	213.6	242.0	211.2	239.3	37.3	37.0	
Std Dv	.51	.37	.53	.66	.13	.26	.39	.08	21.3	2.9	40.3	.0	40.1	3.3	.0	
90% CI	.42	.31	.44	.54	.11	.21	.32	.07	17.5	2.4	33.2	.0	33.0	2.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-G-3-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/25/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh																
D8	82.24	79.90	71.53	83.43	-.05	-.10	-.41	-.08	93.0	211.7	211.9	211.2	211.5	37.6	41.2	S-N
D9	82.87	80.16	70.57	83.32	.19	.17	.18	-.37	58.3	217.8	256.0	211.2	248.3	44.2	41.2	N-S
Avg.	82.55	80.03	71.05	83.38	.07	.04	-.11	-.22	75.7	214.8	233.9	211.2	229.9	40.9	41.2	
Std Dv	.45	.18	.68	.08	.17	.19	.42	.21	24.5	4.3	31.2	.0	26.0	4.7	.0	
90% CI	1.99	.82	3.03	.35	.76	.85	1.86	.92	109.5	19.3	139.2	.0	116.2	20.8	.0	
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh																
D10	81.43	78.95	68.65	80.29	.04	-.12	-.42	-.18	102.6	214.7	220.0	211.2	216.4	30.3	32.9	S-N
D11	82.13	78.24	67.81	81.60	-.06	-.89	.24	-.39	66.6	212.3	231.4	211.2	230.2	35.0	32.9	N-S
Avg.	81.78	78.60	68.23	80.94	-.01	-.50	-.09	-.28	84.6	213.5	225.7	211.2	223.3	32.7	32.9	
Std Dv	.49	.50	.59	.93	.07	.54	.47	.15	25.5	1.7	8.1	.0	9.8	3.3	.0	
90% CI	2.21	2.24	2.65	4.14	.32	2.43	2.08	.66	113.7	7.6	36.0	.0	43.6	14.8	.0	
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh																
D12	81.92	79.34	68.93	81.58	-.08	-.05	-.61	.06	102.4	212.5	217.5	211.2	216.2	25.2	28.8	S-N
D13	81.99	77.56	66.32	80.75	.10	-1.37	.29	-.28	47.5	215.1	292.0	211.2	286.7	31.4	28.8	N-S
Avg.	81.96	78.45	67.63	81.17	.01	-.71	-.16	-.11	74.9	213.8	254.8	211.2	251.5	28.3	28.8	
Std Dv	.05	1.26	1.85	.59	.13	.93	.64	.24	38.8	1.8	52.7	.0	49.9	4.4	.0	
90% CI	.22	5.62	8.24	2.62	.57	4.17	2.84	1.07	173.3	8.2	235.2	.0	222.6	19.6	.0	
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh																
D14	82.20	79.51	67.05	79.98	-.17	-.34	-.36	.35	96.2	210.2	211.5	211.2	212.5	22.6	24.7	S-N
D15	82.30	77.78	66.17	80.56	.11	-1.25	.44	-.30	57.9	214.7	253.3	211.2	249.3	27.8	24.7	N-S
Avg.	82.25	78.65	66.61	80.27	-.03	-.80	.04	.02	77.1	212.4	232.4	211.2	230.9	25.2	24.7	
Std Dv	.07	1.22	.62	.41	.20	.64	.57	.46	27.1	3.2	29.6	.0	26.0	3.7	.0	
90% CI	.32	5.46	2.78	1.83	.88	2.87	2.53	2.05	120.9	14.2	132.0	.0	116.2	16.4	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-H-1-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 50.0 kts																
B17	92.58	90.41	83.63	95.42	-.34	-.42	1.06	.00	66.8	113.0	122.9	118.2	128.6	31.4	25.7	N-S
B18	89.96	86.49	77.79	91.05	-.22	-.53	.93	.00	124.4	114.6	138.8	118.2	143.2	30.9	25.7	N-S
B19	93.03	90.58	81.77	94.36	-.31	-.55	.97	.00	94.8	113.4	113.8	118.2	118.6	30.9	25.7	N-S
B20	93.98	91.81	82.80	95.33	.35	.16	.61	.00	93.2	121.3	121.5	118.2	118.4	30.3	25.7	N-S
B21	93.97	92.19	83.79	95.49	.10	.11	.68	.00	75.9	119.5	123.2	118.2	121.9	30.3	25.7	N-S
B22	94.11	91.94	83.53	95.46	-.54	-.94	.89	.00	74.1	111.6	116.0	118.2	122.9	29.8	25.7	N-S
Avg.	92.94	90.57	82.22	94.52	-.16	-.36	.86	.00	88.2	115.6	122.7	118.2	125.6	30.6	25.7	
Std Dv	1.58	2.13	2.29	1.75	.33	.42	.17	.00	20.9	3.9	8.8	.0	9.4	.6	.0	
90% CI	1.30	1.75	1.89	1.44	.27	.35	.14	.00	17.2	3.2	7.2	.0	7.7	.5	.0	
TAKEOFF -- TARGET IAS 50.0 kts																
C29	85.01	81.09	71.19	86.15	-.33	-.37	1.07	.00	104.2	136.2	140.5	141.5	146.0	30.3	24.7	N-S
C30	85.33	81.29	70.70	85.56	1.79	1.61	-.05	.00	111.4	166.9	179.3	141.5	152.0	28.8	24.7	N-S
C31	85.05	81.20	70.75	85.49	1.06	.95	.16	.00	112.8	156.1	169.2	141.5	153.4	28.3	24.7	N-S
C32	85.45	80.84	70.23	85.69	.58	-.11	.53	.00	96.6	149.0	149.9	141.5	142.4	29.3	24.7	N-S
C33	85.36	82.00	70.50	85.28	-.26	-.25	.88	.00	121.2	137.5	160.8	141.5	165.5	29.3	24.7	N-S
C34	86.03	81.95	71.60	86.43	-.16	-.22	.86	.00	113.0	138.0	149.9	141.5	153.7	29.3	24.7	N-S
Avg.	85.37	81.39	70.83	85.77	.45	.27	.57	.00	109.9	147.3	158.3	141.5	152.2	29.2	24.7	
Std Dv	.37	.47	.49	.44	.86	.82	.44	.00	8.5	12.4	14.3	.0	7.9	.7	.0	
90% CI	.30	.39	.41	.36	.70	.67	.36	.00	7.0	10.2	11.8	.0	6.5	.5	.0	
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh																
A1	84.85	80.88	70.23	85.06	-1.02	-.94	.70	1.50	121.5	134.8	158.0	148.8	174.4	51.4	48.4	
A2	84.17	80.10	70.21	85.50	-1.36	-1.54	-.59	1.50	85.0	130.3	130.8	148.8	149.3	37.0	48.4	
A3	84.11	80.03	70.44	85.07	-1.17	-1.08	.90	1.50	111.9	132.7	143.0	148.8	160.3	53.0	48.4	
A5	83.83	79.93	69.91	84.93	-1.60	-1.49	-.19	1.50	103.9	127.1	131.0	148.8	153.2	39.6	48.4	
A6	84.05	79.68	70.46	85.46	-1.28	-1.17	.76	1.52	121.2	131.6	153.8	148.8	173.8	50.9	48.4	
A7	83.82	79.60	70.13	85.08	-.69	-.69	-.66	1.52	96.6	138.2	139.1	148.8	149.7	38.6	48.4	
Avg.	84.14	80.04	70.23	85.18	-1.19	-1.15	.15	1.51	106.7	132.4	142.6	148.8	160.1	45.1	48.4	
Std Dv	.38	.46	.20	.24	.31	.33	.72	.01	14.4	3.8	11.4	.0	11.5	7.4	.0	
90% CI	.31	.38	.17	.19	.26	.27	.59	.01	11.8	3.1	9.4	.0	9.5	6.1	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-H-1-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh																
D8	86.66	82.50	71.54	86.65	-1.51	-1.46	.94	2.72	100.6	127.7	129.9	148.8	151.3	57.1	53.5	N-S
D9	87.10	83.17	72.18	86.91	-1.75	-1.65	.02	2.72	108.5	125.3	132.1	148.8	156.8	45.3	53.5	S-N
Avg.	86.88	82.83	71.86	86.78	-1.63	-1.56	.48	2.72	104.6	126.5	131.0	148.8	154.1	51.2	53.5	
Std Dv	.31	.47	.45	.18	.17	.13	.65	.00	5.6	1.7	1.6	.0	3.9	8.3	.0	
90% CI	1.39	2.12	2.02	.82	.76	.60	2.90	.00	24.9	7.6	6.9	.0	17.4	37.3	.0	
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh																
D10	83.52	78.91	69.92	85.91	-.22	-.29	.48	.38	95.2	144.4	145.0	148.8	149.4	46.3	42.7	N-S
D11	84.11	79.65	70.02	85.34	-1.14	-1.17	-.47	.31	94.8	131.6	132.1	148.8	149.3	34.0	42.7	S-N
Avg.	83.82	79.28	69.97	85.63	-.68	-.73	.00	.34	95.0	138.0	138.6	148.8	149.4	40.2	42.7	
Std Dv	.42	.52	.07	.40	.65	.62	.67	.05	.3	9.1	9.1	.0	.1	8.7	.0	
90% CI	1.86	2.34	.32	1.80	2.90	2.78	3.00	.22	1.3	40.4	40.7	.0	.3	38.8	.0	
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh																
D12	83.30	78.66	70.52	85.65	.01	-.14	.38	-.28	90.4	147.3	147.3	148.8	148.7	40.6	37.6	N-S
D13	83.59	78.92	70.13	85.34	-.57	-.63	-.87	-.28	92.3	139.4	139.5	148.8	148.9	28.8	37.6	S-N
Avg.	83.45	78.79	70.32	85.49	-.28	-.38	-.25	-.28	91.4	143.4	143.4	148.8	148.8	34.7	37.6	
Std Dv	.21	.18	.28	.22	.41	.35	.88	.00	1.3	5.6	5.5	.0	.1	8.3	.0	
90% CI	.92	.82	1.23	.98	1.83	1.55	3.95	.00	6.0	24.9	24.6	.0	.6	37.3	.0	
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh																
D14	83.60	79.92	70.60	85.62	-.57	-.71	.82	-.87	91.6	139.2	139.3	148.8	148.8	36.0	31.9	N-S
D15	84.54	79.80	71.61	86.48	-.01	-.12	-.75	-.29	105.4	148.5	154.0	148.8	154.3	26.7	31.9	S-N
Avg.	84.07	79.86	71.10	86.05	-.29	-.41	.03	-.58	98.5	143.9	146.6	148.8	151.6	31.4	31.9	
Std Dv	.66	.08	.71	.61	.40	.42	1.11	.41	9.8	6.6	10.4	.0	3.9	6.6	.0	
90% CI	2.97	.38	3.19	2.72	1.77	1.86	4.96	1.83	43.6	29.4	46.4	.0	17.4	29.4	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-H-2-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 50.0 kts																
B17	86.73	84.94	76.54	88.34	-.46	-.44	1.06	.00	49.9	182.3	238.4	191.0	249.8	31.4	25.7	N-S
B18	86.29	84.09	74.64	87.14	-.07	-.11	.84	.00	118.4	188.7	214.7	191.0	217.2	30.9	25.7	N-S
B19	89.03	87.09	77.03	88.47	-.50	-.77	1.02	.00	59.3	181.3	210.9	191.0	222.2	30.9	25.7	N-S
B20	87.64	86.12	77.50	89.14	-.04	-.02	.74	.00	94.6	190.3	190.9	191.0	191.6	30.3	25.7	N-S
B21	88.43	86.64	76.16	87.94	-.28	-.31	.87	.00	70.1	184.7	196.4	191.0	203.0	30.3	25.7	N-S
B22	87.40	85.66	74.48	86.09	-.29	-.83	.77	.00	82.9	185.4	186.9	191.0	192.4	29.8	25.7	N-S
Avg.	87.59	85.76	76.06	87.85	-.27	-.41	.88	.00	79.2	185.4	206.4	191.0	212.7	30.6	25.7	
Std Dv	1.02	1.11	1.25	1.09	.19	.33	.13	.00	25.0	3.5	19.2	.0	22.1	.6	.0	
90% CI	.84	.91	1.03	.89	.16	.28	.11	.00	20.6	2.9	15.8	.0	18.2	.5	.0	
TAKEOFF -- TARGET IAS 50.0 kts																
C29	82.28	79.78	68.08	81.07	-.23	-.25	1.03	.00	106.6	200.3	209.1	206.2	215.2	30.3	24.7	N-S
C30	82.48	79.60	68.83	81.69	.89	.76	.35	.00	101.9	221.7	226.6	206.2	210.7	28.8	24.7	N-S
C31	82.55	80.01	68.52	81.21	.41	.33	.46	.00	106.2	212.4	221.1	206.2	214.7	28.3	24.7	N-S
C32	82.44	79.61	68.06	81.26	.16	-.25	.72	.00	115.8	207.4	230.5	206.2	229.1	29.3	24.7	N-S
C33	82.25	79.24	67.91	80.29	-.28	-.32	.90	.00	103.8	199.1	205.0	206.2	212.3	29.3	24.7	N-S
C34	82.74	80.29	68.57	81.00	-.20	-.19	.85	.00	79.6	201.5	204.9	206.2	209.6	29.3	24.7	N-S
Avg.	82.46	79.75	68.33	81.09	.12	.01	.72	.00	102.3	207.1	216.2	206.2	215.3	29.2	24.7	
Std Dv	.18	.36	.36	.46	.46	.44	.26	.00	12.1	8.8	11.3	.0	7.1	.7	.0	
90% CI	.15	.30	.30	.38	.38	.36	.22	.00	10.0	7.2	9.3	.0	5.9	.5	.0	
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh																
A1	85.31	82.81	71.12	83.48	-.76	-.66	.55	2.77	75.1	198.2	205.2	211.2	218.6	51.4	48.4	N-S
A2	85.09	82.04	70.41	83.95	-.42	-.85	-1.01	1.42	52.9	203.9	255.8	211.2	265.0	37.0	48.4	S-N
A3	84.94	82.25	71.21	83.97	-1.02	-1.06	.81	2.77	95.6	192.1	193.0	211.2	212.2	53.0	48.4	N-S
A5	85.06	81.50	70.01	83.66	-.73	-1.78	-.58	1.42	41.3	197.5	299.1	211.2	319.9	39.6	48.4	S-N
A6	85.22	82.79	71.16	83.52	-.99	-.88	.61	2.92	81.7	193.7	195.7	211.2	213.5	50.9	48.4	N-S
A7	85.22	82.04	70.38	83.63	-.17	-.58	-.91	1.60	53.9	207.9	257.3	211.2	261.4	38.6	48.4	S-N
Avg.	85.14	82.24	70.72	83.74	-.68	-.97	-.09	2.15	66.7	198.9	234.3	211.2	248.4	45.1	48.4	
Std Dv	.13	.50	.51	.22	.33	.43	.83	.74	20.6	6.0	43.0	.0	42.4	7.4	.0	
90% CI	.11	.41	.42	.18	.27	.36	.69	.61	17.0	5.0	35.3	.0	34.8	6.1	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-H-2-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh																
D8	88.00	85.29	72.48	85.37	-.87	-1.02	.72	4.30	76.8	190.8	196.0	211.2	217.0	57.1	53.5	N-S
D9	86.35	83.83	72.83	84.92	.02	-.25	-.64	1.53	80.1	206.8	209.9	211.2	214.4	45.3	53.5	S-N
Avg.	87.18	84.56	72.65	85.15	-.43	-.63	.04	2.91	78.4	198.8	202.9	211.2	215.7	51.2	53.5	
Std Dv	1.17	1.03	.25	.32	.63	.54	.96	1.96	2.3	11.3	9.8	.0	1.8	8.3	.0	
90% CI	5.21	4.61	1.10	1.42	2.81	2.43	4.29	8.74	10.4	50.5	43.9	.0	8.2	37.3	.0	
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh																
D10	82.63	78.89	67.56	80.61	-.62	-1.50	.60	1.41	91.8	199.4	199.5	211.2	211.3	46.3	42.7	N-S
D11	85.48	82.40	69.98	84.36	-.30	-.28	-.88	1.52	50.1	205.6	268.1	211.2	275.4	34.0	42.7	S-N
Avg.	84.06	80.65	68.77	82.49	-.46	-.89	-.14	1.46	70.9	202.5	233.8	211.2	243.4	40.2	42.7	
Std Dv	2.02	2.48	1.71	2.65	.23	.86	1.05	.08	29.5	4.4	48.5	.0	45.3	8.7	.0	
90% CI	9.00	11.08	7.64	11.84	1.01	3.85	4.67	.35	131.6	19.6	216.6	.0	202.4	38.8	.0	
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh																
D12	81.40	78.40	68.63	81.56	-.83	-.78	.67	.43	94.5	195.6	196.2	211.2	211.9	40.6	37.6	N-S
D13	83.68	79.64	67.67	81.57	-.11	-1.30	-1.10	1.11	57.5	208.7	247.6	211.2	250.5	28.8	37.6	S-N
Avg.	82.54	79.02	68.15	81.57	-.47	-1.04	-.22	.77	76.0	202.1	221.9	211.2	231.2	34.7	37.6	
Std Dv	1.61	.88	.68	.01	.51	.37	1.25	.48	26.2	9.3	36.3	.0	27.3	8.3	.0	
90% CI	7.20	3.91	3.03	.03	2.27	1.64	5.59	2.15	116.8	41.4	162.3	.0	121.9	37.3	.0	
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh																
D14	80.98	78.13	67.82	80.88	-.68	-.72	.80	-.36	94.4	198.7	199.3	211.2	211.9	36.0	31.9	N-S
D15	83.02	80.09	69.00	81.54	.18	.17	-.83	.44	78.3	214.7	219.3	211.2	215.7	26.7	31.9	S-N
Avg.	82.00	79.11	68.41	81.21	-.25	-.28	-.02	.04	86.4	206.7	209.3	211.2	213.8	31.4	31.9	
Std Dv	1.44	1.39	.83	.47	.61	.63	1.15	.57	11.4	11.3	14.1	.0	2.7	6.6	.0	
90% CI	6.44	6.19	3.73	2.08	2.72	2.81	5.15	2.53	50.8	50.5	63.1	.0	12.0	29.4	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-H-3-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 50.0 kts																
B17	84.87	81.84	71.99	85.58	.13	.11	.81	.00	65.4	193.0	212.2	191.0	210.0	31.4	25.7	N-S
B18	83.56	80.92	69.99	83.08	-.11	-.11	.84	.00	118.6	188.7	214.9	191.0	217.4	30.9	25.7	N-S
B19	85.56	82.62	71.77	85.28	.27	.18	.71	.00	108.2	194.4	204.6	191.0	201.0	30.9	25.7	N-S
B20	87.16	83.54	72.01	85.32	.26	-.92	.62	.00	98.8	195.5	197.8	191.0	193.2	30.3	25.7	N-S
B21	86.62	83.52	71.18	84.70	.50	-.30	.55	.00	59.7	198.5	229.8	191.0	221.1	30.3	25.7	N-S
B22	86.13	82.66	70.53	84.73	-.12	-1.32	.70	.00	105.1	188.4	195.1	191.0	197.8	29.8	25.7	N-S
Avg.	85.65	82.52	71.25	84.78	.15	-.39	.70	.00	92.6	193.1	209.1	191.0	206.8	30.6	25.7	
Std Dv	1.30	1.01	.84	.90	.24	.60	.11	.00	24.2	4.0	12.8	.0	11.2	.6	.0	
90% CI	1.07	.83	.69	.74	.20	.49	.09	.00	19.9	3.3	10.5	.0	9.2	.5	.0	
TAKEOFF -- TARGET IAS 50.0 kts																
C29	83.78	80.30	66.79	80.56	-.02	-.26	.93	.00	126.2	204.8	254.0	206.2	255.6	30.3	24.7	N-S
C30	83.70	79.57	65.86	81.16	1.11	.07	.25	.00	56.4	227.0	272.6	206.2	247.6	28.8	24.7	N-S
C31	83.68	79.64	66.37	81.03	.79	-.14	.30	.00	51.2	220.4	283.0	206.2	264.7	28.3	24.7	N-S
C32	83.98	80.59	68.42	82.13	.55	.45	.56	.00	121.0	215.2	251.0	206.2	240.4	29.3	24.7	N-S
C33	83.04	80.01	68.06	80.78	.15	.12	.72	.00	130.8	207.7	274.1	206.2	272.1	29.3	24.7	N-S
C34	83.53	80.40	67.22	81.40	.06	.04	.75	.00	51.6	206.0	262.8	206.2	263.0	29.3	24.7	N-S
Avg.	83.62	80.08	67.12	81.18	.44	.05	.58	.00	89.5	213.5	266.3	206.2	257.2	29.2	24.7	
Std Dv	.32	.42	.98	.55	.45	.24	.27	.00	40.1	8.9	12.5	.0	11.7	.7	.0	
90% CI	.26	.34	.81	.45	.37	.20	.22	.00	33.0	7.3	10.3	.0	9.7	.5	.0	
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh																
A1	84.11	81.14	69.93	82.68	-.20	-.82	.40	1.42	56.5	205.0	246.0	211.2	253.5	51.4	48.4	N-S
A2	84.86	82.22	70.38	83.16	-.95	-.88	-.78	2.77	95.6	193.3	194.2	211.2	212.2	37.0	48.4	S-N
A3	84.44	82.20	71.10	84.00	-.19	-.16	.47	1.42	54.3	208.1	256.4	211.2	260.2	53.0	48.4	N-S
A5	84.91	82.25	70.84	83.15	-.78	-.98	-.54	2.77	91.3	195.7	195.7	211.2	211.3	39.6	48.4	S-N
A6	84.21	81.88	69.99	82.03	-.32	-.29	.36	1.60	102.6	205.2	210.2	211.2	216.4	50.9	48.4	N-S
A7	84.85	81.99	69.90	82.38	-.57	-.56	-.74	2.92	81.6	199.8	202.0	211.2	213.5	38.6	48.4	S-N
Avg.	84.56	81.95	70.36	82.90	-.50	-.62	-.14	2.15	80.3	201.2	217.4	211.2	227.8	45.1	48.4	
Std Dv	.36	.42	.51	.70	.32	.34	.61	.74	20.5	5.9	27.0	.0	22.6	7.4	.0	
90% CI	.29	.35	.42	.57	.26	.28	.50	.61	16.8	4.8	22.2	.0	18.6	6.1	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING. THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

TABLE B-H-3-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh																
D8	85.25	83.32	72.57	84.56	-.46	-.41	.46	1.56	77.0	202.9	208.2	211.2	216.8	57.1	53.5	N-S
D9	87.73	85.34	73.06	85.47	-1.36	-1.42	-.12	4.30	86.9	183.3	183.6	211.2	211.5	45.3	53.5	S-N
Avg.	86.49	84.33	72.82	85.01	-.91	-.91	.17	2.93	81.9	193.1	195.9	211.2	214.1	51.2	53.5	
Std Dv	1.75	1.43	.35	.64	.64	.71	.41	1.94	7.0	13.9	17.4	.0	3.7	8.3	.0	
90% CI	7.83	6.38	1.55	2.87	2.84	3.19	1.83	8.65	31.3	61.9	77.7	.0	16.7	37.3	.0	
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh																
D10	83.79	80.77	68.51	81.67	.47	.08	.24	1.39	78.9	216.5	220.6	211.2	215.2	46.3	42.7	N-S
D11	82.84	80.27	68.77	81.38	-.79	-.91	-.61	1.42	81.6	193.2	195.4	211.2	213.5	34.0	42.7	S-N
Avg.	83.32	80.52	68.64	81.52	-.16	-.42	-.19	1.40	80.3	204.9	208.0	211.2	214.4	40.2	42.7	
Std Dv	.67	.35	.18	.21	.89	.70	.60	.02	1.9	16.5	17.8	.0	1.2	8.7	.0	
90% CI	3.00	1.58	.82	.92	3.98	3.13	2.68	.09	8.5	73.6	79.6	.0	5.4	38.8	.0	
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh																
D12	83.55	80.62	68.70	81.46	.87	.60	.09	1.11	67.7	223.9	242.0	211.2	228.3	40.6	37.6	N-S
D13	81.43	79.00	68.51	81.33	-.36	-.52	-.93	.43	90.1	200.7	200.7	211.2	211.2	28.8	37.6	S-N
Avg.	82.49	79.81	68.60	81.40	.25	.04	-.42	.77	78.9	212.3	221.4	211.2	219.8	34.7	37.6	
Std Dv	1.50	1.15	.13	.09	.87	.79	.72	.48	15.8	16.4	29.2	.0	12.1	8.3	.0	
90% CI	6.69	5.11	.60	.41	3.88	3.54	3.22	2.15	70.7	73.2	130.4	.0	54.0	37.3	.0	
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh																
D14	82.73	78.17	65.78	79.97	.17	-1.69	.55	.99	42.5	210.3	311.6	211.2	312.9	36.0	31.9	N-S
D15	81.55	78.58	67.91	80.98	.00	-.22	-.68	-.04	103.5	207.4	213.2	211.2	217.2	26.7	31.9	S-N
Avg.	82.14	78.38	66.85	80.48	.09	-.96	-.07	.47	73.0	208.9	262.4	211.2	265.0	31.4	31.9	
Std Dv	.83	.29	1.51	.71	.12	1.04	.87	.73	43.1	2.1	69.6	.0	67.7	6.6	.0	
90% CI	3.73	1.29	6.72	3.19	.54	4.64	3.88	3.25	192.6	9.2	310.6	.0	302.1	29.4	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

TABLE B-I-1-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/23/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	PNLTm	ALm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 50.0 kts																
B16	93.93	92.40	84.52	95.74	-.26	-.22	.33	.00	71.7	116.2	122.4	118.2	124.6	27.3	25.7	N-S
B17	91.55	89.48	82.65	94.06	-.17	-.26	.51	.00	81.5	115.5	116.8	118.2	119.5	28.3	25.7	N-S
B18	91.85	90.04	83.62	94.80	-.72	-.67	.46	.00	71.7	110.5	116.4	118.2	124.5	26.7	25.7	N-S
B19	93.46	91.33	83.62	95.53	-.58	-.99	.48	.00	75.6	112.0	115.7	118.2	122.1	27.3	25.7	N-S
B20	93.04	91.74	82.87	93.36	-.37	-.34	.62	.00	45.9	114.8	159.9	118.2	164.7	28.8	25.7	N-S
B21	93.53	91.94	83.40	94.36	.17	.18	.07	.00	70.8	121.1	128.3	118.2	125.2	26.7	25.7	N-S
Avg.	92.89	91.15	83.45	94.64	-.32	-.38	.41	.00	69.5	115.0	126.6	118.2	130.1	27.5	25.7	
Std Dv	.97	1.15	.66	.90	.32	.40	.19	.00	12.2	3.7	17.0	.0	17.1	.9	.0	
90% CI	.80	.94	.54	.74	.26	.33	.16	.00	10.1	3.0	14.0	.0	14.1	.7	.0	
TAKEOFF -- TARGET IAS 50.0 kts																
C22	81.59	78.63	67.37	80.56	.11	.13	.57	.00	126.8	144.8	180.9	141.5	176.8	28.8	24.7	N-S
C23	80.90	78.02	67.65	81.11	.43	.42	.37	.00	126.4	149.0	185.1	141.5	175.8	28.3	24.7	N-S
C24	81.36	78.12	67.03	80.57	-.06	-.34	.67	.00	110.6	141.6	151.2	141.5	151.1	28.8	24.7	N-S
C25	81.38	78.26	67.19	80.49	.37	.16	.32	.00	120.6	147.7	171.6	141.5	164.3	27.8	24.7	N-S
C26	81.54	78.34	67.57	80.78	-.23	-.43	.72	.00	117.5	139.7	157.5	141.5	159.5	28.8	24.7	N-S
C27	81.46	78.48	67.68	80.98	.82	.68	.54	.00	125.8	153.6	189.3	141.5	174.3	30.3	24.7	N-S
Avg.	81.37	78.31	67.42	80.75	.24	.10	.53	.00	121.3	146.1	172.6	141.5	167.0	28.8	24.7	
Std Dv	.25	.23	.26	.25	.38	.43	.16	.00	6.4	5.1	15.4	.0	10.4	.8	.0	
90% CI	.20	.19	.22	.21	.31	.35	.13	.00	5.3	4.2	12.7	.0	8.6	.7	.0	
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh																
A1	79.44	76.12	67.20	80.30	-1.96	-1.79	.52	.35	98.8	125.0	126.4	148.8	150.5	45.8	48.4	N-S
A2	79.49	76.28	67.52	81.02	-1.46	-1.35	-.22	.35	88.4	131.5	131.6	148.8	148.8	40.6	48.4	S-N
A3	79.19	75.73	67.09	80.81	-1.54	-1.66	.42	.30	85.3	130.8	131.2	148.8	149.2	46.8	48.4	N-S
A4	79.29	76.04	67.20	80.64	-1.71	-1.56	-.28	.40	95.4	128.5	129.1	148.8	149.4	39.1	48.4	S-N
A5	79.30	75.59	66.49	80.44	-1.57	-1.77	.45	.40	131.0	132.4	175.5	148.8	197.1	47.8	48.4	N-S
A6	79.41	76.17	67.11	80.49	-1.86	-1.67	.00	.46	100.3	126.7	128.8	148.8	151.2	41.2	48.4	S-N
Avg.	79.35	75.99	67.10	80.62	-1.68	-1.63	.15	.38	99.9	129.1	137.1	148.8	157.7	43.5	48.4	
Std Dv	.11	.27	.34	.26	.20	.16	.36	.06	16.3	2.9	18.9	.0	19.3	3.7	.0	
90% CI	.09	.22	.28	.22	.16	.13	.30	.05	13.4	2.4	15.6	.0	15.9	3.0	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

TABLE B-I-1-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/24/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh																
D7	80.28	77.29	69.10	81.86	-2.05	-1.83	.64	.51	110.8	124.6	133.3	148.8	159.1	52.0	53.5	N-S
D8	80.01	76.91	68.28	81.07	-2.02	-1.87	.22	.58	98.9	123.8	125.3	148.8	150.6	46.8	53.5	S-N
Avg.	80.15	77.10	68.69	81.46	-2.03	-1.85	.43	.54	104.9	124.2	129.3	148.8	154.9	49.4	53.5	
Std Dv	.19	.27	.58	.56	.02	.03	.30	.05	8.4	.6	5.7	.0	6.0	3.7	.0	
90% CI	.85	1.20	2.59	2.49	.09	.13	1.33	.22	37.6	2.5	25.3	.0	26.8	16.4	.0	
150 m FLYVOER -- TARGET IAS 83.2 kts -- 0.8Vh																
D9	79.29	75.75	66.93	81.31	-1.37	-1.30	.25	.13	76.1	131.9	135.9	148.8	153.2	40.1	42.7	N-S
D10	79.39	75.61	66.68	80.85	-1.35	-1.54	-.42	.16	75.2	132.2	136.7	148.8	153.8	34.5	42.7	S-N
Avg.	79.34	75.68	66.81	81.08	-1.36	-1.42	-.09	.14	75.6	132.0	136.3	148.8	153.5	37.3	42.7	
Std Dv	.07	.10	.18	.33	.01	.17	.47	.02	.6	.2	.6	.0	.4	4.0	.0	
90% CI	.32	.44	.79	1.45	.06	.76	2.12	.09	2.8	.9	2.5	.0	1.9	17.7	.0	
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh																
D11	79.52	75.52	66.33	80.79	-.89	-1.19	.15	.03	75.0	139.6	144.6	148.8	154.0	36.5	37.6	N-S
D12	79.94	76.14	67.49	81.33	-.74	-1.01	-.65	.03	94.3	139.8	140.2	148.8	149.2	30.3	37.6	S-N
Avg.	79.73	75.83	66.91	81.06	-.81	-1.10	-.25	.03	84.7	139.7	142.4	148.8	151.6	33.4	37.6	
Std Dv	.30	.44	.82	.38	.11	.13	.57	.00	13.6	.1	3.1	.0	3.4	4.4	.0	
90% CI	1.33	1.96	3.66	1.70	.47	.57	2.53	.00	60.9	.6	13.9	.0	15.2	19.6	.0	
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh																
D13	80.04	76.12	66.37	80.47	-.60	-.75	.17	-.01	84.9	143.1	143.7	148.8	149.3	31.9	31.9	N-S
D14	80.53	77.08	67.36	81.17	-1.11	-1.21	-.50	-.00	98.2	134.6	136.0	148.8	150.3	25.7	31.9	S-N
Avg.	80.29	76.60	66.87	80.82	-.86	-.98	-.16	-.00	91.6	138.9	139.9	148.8	149.8	28.8	31.9	
Std Dv	.33	.68	.70	.49	.36	.33	.47	.01	9.4	6.0	5.4	.0	.7	4.4	.0	
90% CI	1.55	3.03	3.13	2.21	1.61	1.45	2.12	.03	42.0	26.8	24.3	.0	3.2	19.6	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-I-2-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/24/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 50.0 kts																
B16	88.08	86.84	76.38	87.67	-.59	-.58	.46	.00	76.4	182.1	187.3	191.0	196.4	27.3	25.7	N-S
B17	85.07	83.39	72.44	84.33	-.57	-.84	.60	.00	108.6	182.6	192.7	191.0	201.5	28.3	25.7	N-S
B18	87.96	86.19	76.64	88.21	-.67	-1.03	.40	.00	61.7	181.1	205.7	191.0	216.9	26.7	25.7	N-S
B19	87.76	86.51	76.67	88.24	-.58	-.52	.45	.00	75.1	182.2	188.5	191.0	197.6	27.3	25.7	N-S
B20	85.66	84.31	74.03	84.41	-.50	-.61	.66	.00	57.7	183.7	217.3	191.0	225.9	28.8	25.7	N-S
B21	88.60	87.17	77.15	88.85	-.48	-.42	.32	.00	61.0	184.3	210.8	191.0	218.4	26.7	25.7	N-S
Avg.	87.19	85.73	75.55	86.95	-.56	-.67	.48	.00	73.4	182.7	200.4	191.0	209.5	27.5	25.7	
Std Dv	1.45	1.52	1.88	2.03	.07	.23	.13	.00	18.9	1.2	12.6	.0	12.5	.9	.0	
90% CI	1.19	1.25	1.55	1.67	.06	.19	.10	.00	15.6	1.0	10.4	.0	10.3	.7	.0	
TAKEOFF -- TARGET IAS 50.0 kts																
C22	79.58	77.18	65.33	78.15	-.12	-.20	.68	.00	98.7	205.8	208.2	206.2	208.6	28.8	24.7	N-S
C23	79.47	76.73	65.08	78.46	.01	-.33	.58	.00	87.7	206.6	206.8	206.2	206.3	28.3	24.7	N-S
C24	79.75	77.09	65.92	79.19	-.33	-.31	.76	.00	95.2	201.8	202.6	206.2	207.0	28.8	24.7	N-S
C25	79.86	77.31	66.10	78.44	-.15	-.10	.67	.00	108.9	206.2	218.0	206.2	218.0	28.8	24.7	N-S
C26	79.96	77.60	66.97	79.56	-.43	-.36	.79	.00	92.7	200.5	200.8	206.2	206.4	28.8	24.7	N-S
C27	79.96	77.40	65.74	79.14	.12	-.08	.81	.00	81.2	210.4	212.9	206.2	208.6	30.3	24.7	N-S
Avg.	79.76	77.22	65.86	78.82	-.15	-.23	.71	.00	94.1	205.2	208.2	206.2	209.2	29.0	24.7	
Std Dv	.20	.30	.66	.55	.21	.12	.09	.00	9.5	3.6	6.4	.0	4.5	.7	.0	
90% CI	.17	.24	.55	.45	.17	.10	.07	.00	7.8	2.9	5.3	.0	3.7	.6	.0	
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh																
A1	78.77	75.61	65.75	78.83	-1.37	-1.62	.25	1.08	93.3	188.5	188.8	211.2	211.6	45.8	48.4	N-S
A2	78.77	76.74	66.76	78.94	-.58	-.45	-.61	.75	86.6	204.5	204.8	211.2	211.6	40.6	48.4	S-N
A3	78.65	75.62	65.79	79.01	-1.18	-1.61	.28	.92	84.4	192.0	192.9	211.2	212.2	46.8	48.4	N-S
A4	78.31	76.27	67.16	79.37	-.67	-.54	-.74	.87	96.6	202.7	204.1	211.2	212.6	39.1	48.4	S-N
A5	78.65	75.95	65.68	78.49	-1.27	-1.17	.37	1.22	128.7	191.7	245.7	211.2	270.7	47.8	48.4	N-S
A6	78.64	76.55	66.14	78.76	-.72	-.63	-.51	1.03	76.4	202.3	208.1	211.2	217.3	41.2	48.4	S-N
Avg.	78.63	76.12	66.21	78.90	-.96	-1.00	-.16	.98	94.3	197.0	207.4	211.2	222.7	43.5	48.4	
Std Dv	.17	.48	.61	.29	.35	.54	.51	.17	18.3	7.0	20.2	.0	23.6	3.7	.0	
90% CI	.14	.39	.50	.24	.28	.44	.42	.14	15.0	5.7	16.6	.0	19.4	3.0	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-I-2-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/24/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh																
D7	81.10	78.57	68.81	82.07	-1.44	-1.27	.36	1.62	93.9	188.6	189.0	211.2	211.7	52.0	53.5	N-S
D8	79.74	77.89	67.72	79.96	-.75	-.65	-.37	1.11	85.9	201.1	201.7	211.2	211.8	46.8	53.5	S-N
Avg.	80.42	78.23	68.26	81.01	-1.10	-.96	-.00	1.37	89.9	194.9	195.4	211.2	211.8	49.4	53.5	
Std Dv	.96	.48	.77	1.49	.49	.44	.52	.36	5.7	8.8	9.0	.0	.1	3.7	.0	
90% CI	4.29	2.15	3.44	6.66	2.18	1.96	2.30	1.61	25.3	39.5	40.1	.0	.3	16.4	.0	
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh																
D9	77.17	74.48	65.04	77.93	-1.14	-1.03	.11	.36	90.3	193.7	193.7	211.2	211.2	40.1	42.7	N-S
D10	77.87	75.06	65.32	77.96	-.34	-.67	-.81	.43	92.7	205.3	205.5	211.2	211.5	34.5	42.7	S-N
Avg.	77.52	74.77	65.18	77.94	-.74	-.85	-.35	.40	91.5	199.5	199.6	211.2	211.4	37.3	42.7	
Std Dv	.49	.41	.20	.02	.57	.25	.65	.05	1.7	8.2	8.3	.0	.2	4.0	.0	
90% CI	2.21	1.83	.88	.09	2.53	1.14	2.90	.22	7.6	36.6	37.3	.0	.9	17.7	.0	
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh																
D11	77.25	74.41	63.91	76.90	-.99	-1.10	.17	.06	72.6	197.6	207.2	211.2	221.4	36.5	37.6	N-S
D12	77.72	75.05	64.68	77.24	-.17	-.16	-.91	.15	106.9	211.0	220.6	211.2	220.8	30.3	37.6	S-N
Avg.	77.49	74.73	64.29	77.07	-.58	-.63	-.37	.11	89.8	204.3	213.9	211.2	221.1	33.4	37.6	
Std Dv	.33	.45	.54	.24	.58	.66	.76	.06	24.3	9.5	9.5	.0	.4	4.4	.0	
90% CI	1.48	2.02	2.43	1.07	2.59	2.97	3.41	.28	108.3	42.3	42.3	.0	1.9	19.6	.0	
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh																
D13	77.54	74.43	63.80	77.17	-.71	-.62	.19	-.07	85.0	202.2	202.9	211.2	212.0	31.9	31.9	N-S
D14	77.57	74.86	64.12	77.34	-.48	-.70	-.83	-.00	86.8	206.4	206.8	211.2	211.6	25.7	31.9	S-N
Avg.	77.56	74.65	63.96	77.25	-.59	-.66	-.32	-.04	85.9	204.3	204.9	211.2	211.8	28.8	31.9	
Std Dv	.02	.30	.23	.12	.16	.05	.72	.06	1.3	3.0	2.8	.0	.3	4.4	.0	
90% CI	.09	1.36	1.01	.54	.73	.25	3.22	.25	5.7	13.3	12.3	.0	1.3	19.6	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department of Transportation
Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-I-3-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/24/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 50.0 kts																
B16	85.49	81.76	70.05	83.67	.21	-1.34	.11	.00	114.7	197.0	216.9	191.0	210.2	27.3	25.7	N-S
B17	85.31	82.09	71.30	84.57	.12	-.96	.30	.00	114.3	195.7	214.6	191.0	209.4	28.3	25.7	N-S
B18	82.73	80.67	69.96	82.76	-.08	-.10	.16	.00	81.3	191.4	193.6	191.0	193.2	26.7	25.7	N-S
B19	85.11	83.26	70.20	83.38	-.05	-.16	.23	.00	107.4	192.0	201.2	191.0	200.1	27.3	25.7	N-S
B20	86.03	84.01	71.02	83.79	.06	-.34	.42	.00	58.9	193.9	226.4	191.0	223.1	28.8	25.7	N-S
B21	85.48	83.61	71.32	84.39	.46	.42	-.05	.00	99.2	200.9	203.5	191.0	193.5	26.7	25.7	N-S
Avg.	85.03	82.57	70.64	83.76	.12	-.41	.20	.00	96.0	195.2	209.4	191.0	204.9	27.5	25.7	
Std Dv	1.17	1.27	.64	.66	.20	.64	.16	.00	22.0	3.5	12.0	.0	11.6	.9	.0	
90% CI	.96	1.05	.53	.55	.16	.52	.13	.00	18.1	2.9	9.9	.0	9.5	.7	.0	
TAKEOFF -- TARGET IAS 50.0 kts																
C22	79.97	77.08	64.74	78.19	.12	-.39	.57	.00	78.4	211.1	215.5	206.2	210.5	28.8	24.7	N-S
C23	79.56	75.30	63.63	76.99	.38	-1.40	.39	.00	91.4	216.1	216.2	206.2	206.2	28.3	24.7	N-S
C24	79.22	76.32	64.60	77.37	.08	-.26	.58	.00	116.6	210.6	235.5	206.2	230.5	28.8	24.7	N-S
C25	79.17	76.05	63.38	76.73	.37	-.25	.33	.00	85.7	214.9	215.5	206.2	206.7	27.8	24.7	N-S
C26	80.05	76.69	63.69	77.08	-.06	-.89	.66	.00	96.6	206.7	208.1	206.2	207.5	28.8	24.7	N-S
C27	79.97	76.86	64.19	77.74	.47	-.15	.69	.00	89.7	216.6	216.6	206.2	206.2	30.3	24.7	N-S
Avg.	79.66	76.38	64.04	77.35	.23	-.56	.54	.00	93.1	212.7	217.9	206.2	211.3	28.8	24.7	
Std Dv	.40	.65	.56	.54	.21	.49	.15	.00	13.0	3.9	9.2	.0	9.6	.8	.0	
90% CI	.33	.53	.46	.44	.17	.40	.12	.00	10.7	3.2	7.6	.0	7.9	.7	.0	
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh																
A1	78.79	76.37	66.54	79.35	-.75	-.60	-.04	.75	79.8	201.6	204.9	211.2	214.6	45.8	48.4	N-S
A2	78.94	76.18	66.49	79.56	-1.05	-1.06	-.39	1.08	92.7	194.4	194.6	211.2	211.4	40.6	48.4	S-N
A3	78.90	76.81	68.07	80.62	-.42	-.40	-.03	.63	90.6	205.7	205.8	211.2	211.2	46.8	48.4	N-S
A4	78.84	76.29	66.90	79.60	-1.29	-1.09	-.51	1.22	97.2	192.1	193.6	211.2	212.9	39.1	48.4	S-N
A5	78.22	76.03	66.12	78.98	-.40	-.54	.01	.87	117.3	208.1	234.2	211.2	237.7	47.8	48.4	N-S
A6	78.92	76.21	66.52	79.16	-1.25	-1.17	-.24	1.39	100.7	190.2	193.5	211.2	214.9	41.2	48.4	S-N
Avg.	78.77	76.31	66.77	79.55	-.86	-.81	-.20	.99	96.4	198.7	204.4	211.2	217.1	43.5	48.4	
Std Dv	.27	.27	.68	.58	.40	.33	.22	.29	12.5	7.5	15.6	.0	10.2	3.7	.0	
90% CI	.23	.22	.56	.47	.33	.27	.18	.24	10.3	6.2	12.9	.0	8.4	3.0	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-I-3-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/24/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh																
D7	79.39	77.47	68.48	80.71	-.72	-.70	.08	.96	86.0	201.2	201.7	211.2	211.7	52.0	53.5	N-S
D8	81.06	78.43	68.46	81.45	-1.38	-1.31	-.06	1.85	93.4	187.5	187.8	211.2	211.6	46.8	53.5	S-N
Avg.	80.22	77.95	68.47	81.08	-1.05	-1.00	.01	1.40	89.7	194.4	194.8	211.2	211.6	49.4	53.5	
Std Dv	1.18	.68	.01	.52	.47	.43	.10	.63	5.2	9.7	9.8	.0	.1	3.7	.0	
90% CI	5.27	3.03	.06	2.34	2.08	1.93	.44	2.81	23.4	43.3	43.9	.0	.3	16.4	.0	
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh																
D9	77.77	74.70	64.63	77.82	-.71	-.98	-.15	.33	34.5	205.6	363.4	211.2	373.3	40.1	42.7	N-S
D10	78.11	74.88	65.38	78.52	-1.07	-1.03	-.57	.43	93.3	194.3	194.7	211.2	211.6	34.5	42.7	S-N
Avg.	77.94	74.79	65.00	78.17	-.89	-1.00	-.36	.38	63.9	200.0	279.0	211.2	292.5	37.3	42.7	
Std Dv	.24	.13	.53	.49	.25	.04	.30	.07	41.6	8.0	119.3	.0	114.3	4.0	.0	
90% CI	1.07	.57	2.37	2.21	1.14	.16	1.33	.32	185.6	35.7	532.6	.0	510.5	17.7	.0	
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh																
D11	78.52	75.05	64.68	77.95	-.15	-.11	-.13	.15	92.8	211.9	212.2	211.2	211.5	36.5	37.6	N-S
D12	78.27	74.68	65.59	78.85	-.69	-.82	-.66	.06	108.3	198.9	209.5	211.2	222.4	30.3	37.6	S-N
Avg.	78.40	74.87	65.13	78.40	-.42	-.47	-.40	.11	100.6	205.4	210.9	211.2	216.9	33.4	37.6	
Std Dv	.18	.26	.64	.64	.38	.50	.37	.06	11.0	9.2	1.9	.0	7.7	4.4	.0	
90% CI	.79	1.17	2.87	2.84	1.70	2.24	1.67	.28	48.9	41.0	8.5	.0	34.4	19.6	.0	
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh																
D13	77.83	75.14	63.40	76.88	-.06	-.12	-.02	.05	80.7	212.3	215.2	211.2	214.1	31.9	31.9	N-S
D14	77.89	74.90	65.23	78.33	-.92	-.87	-.61	.01	90.7	196.4	196.5	211.2	211.2	25.7	31.9	S-N
Avg.	77.86	75.02	64.32	77.60	-.49	-.50	-.31	.02	85.7	204.4	205.9	211.2	212.6	28.8	31.9	
Std Dv	.04	.17	1.29	1.03	.61	.53	.42	.04	7.1	11.2	13.2	.0	2.1	4.4	.0	
90% CI	.19	.76	5.78	4.58	2.72	2.37	1.86	.19	31.6	50.2	59.0	.0	9.2	19.6	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department of Transportation
Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-J-1-1

ENSTROM 280FX HELICOPTER (PISTON ENGINE)

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/26/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 50.4 kts																
BP9	88.78	85.87	76.30	90.06	.56	-.30	1.04	.00	106.7	115.2	120.3	118.2	123.4	31.9	25.7	N-S
BP10	90.33	87.69	78.76	91.88	-.36	-.59	1.02	.00	100.7	113.8	115.8	118.2	120.3	31.4	25.7	N-S
BP11	88.38	85.45	76.04	90.10	.23	.21	.80	.00	110.1	121.9	129.8	118.2	125.9	31.9	25.7	N-S
BP12	89.69	87.36	79.59	91.89	-.34	-.31	1.05	.00	109.8	115.1	122.3	118.2	125.6	31.9	25.7	N-S
BP13	89.90	87.67	79.19	91.47	-.65	-.61	1.12	.00	108.2	111.4	117.3	118.2	124.5	31.4	25.7	N-S
BP14	89.91	87.39	78.60	91.42	-.46	-.44	1.11	.00	107.3	113.4	118.8	118.2	123.8	31.9	25.7	N-S
Avg.	89.50	86.90	78.08	91.14	-.17	-.34	1.02	.00	107.1	115.1	120.7	118.2	123.9	31.7	25.7	
Std Dv	.75	.98	1.52	.84	.46	.30	.12	.00	3.4	3.6	5.0	.0	2.0	.3	.0	
90% CI	.62	.81	1.25	.69	.38	.25	.10	.00	2.8	3.0	4.1	.0	1.7	.2	.0	
TAKEOFF -- TARGET IAS 50.4 kts																
CP22	88.43	84.69	75.21	89.24	1.30	.69	.32	.00	110.2	132.3	141.0	121.9	123.9	30.9	25.2	N-S
CP23	87.97	84.88	74.59	88.67	.68	.52	.65	.00	120.3	124.7	144.3	121.9	134.6	31.4	25.2	N-S
CP24	88.53	84.98	75.19	89.05	1.00	.69	.30	.00	122.6	128.4	152.4	121.9	138.1	29.8	25.2	N-S
CP25	87.77	84.41	74.00	87.88	.96	.66	.16	.00	118.3	128.0	145.3	121.9	132.0	28.8	25.2	N-S
CP26	87.64	84.44	74.01	87.56	.71	.62	.35	.00	125.2	124.9	152.9	121.9	142.3	29.3	25.2	N-S
CP27	88.33	84.98	75.40	88.88	.88	.76	.43	.00	131.0	126.8	168.0	121.9	154.1	30.3	25.2	N-S
Avg.	88.11	84.73	74.73	88.55	.92	.66	.37	.00	121.3	127.5	150.7	121.9	137.5	30.1	25.2	
Std Dv	.37	.26	.63	.68	.23	.08	.16	.00	7.0	2.8	9.7	.0	10.2	1.0	.0	
90% CI	.30	.21	.52	.56	.19	.07	.13	.00	5.7	2.3	8.0	.0	8.4	.8	.0	
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh																
AP42	83.04	80.42	71.08	84.59	.50	.30	.35	-.49	106.5	153.9	160.5	121.9	155.1	52.0	46.3	N-S
AP43	83.21	80.31	71.79	85.36	.38	.19	-.67	-.20	98.3	152.2	153.8	121.9	150.3	40.6	46.3	S-N
AP44	83.20	80.05	73.09	86.38	.50	.32	.56	-.67	96.2	154.0	154.9	121.9	149.6	54.5	46.3	N-S
AP45	83.77	80.58	72.39	85.86	.36	.16	-.35	-.51	95.0	152.1	152.7	121.9	149.3	43.7	46.3	S-N
AP46	83.16	80.44	71.33	85.00	.89	.67	.19	-.40	102.2	159.7	163.4	121.9	152.2	52.0	46.3	N-S
AP47	82.93	79.97	71.33	85.15	.92	.68	-.77	-.49	124.4	159.8	193.7	121.9	180.3	41.7	46.3	S-N
Avg.	83.22	80.30	71.83	85.39	.59	.39	-.12	-.46	103.8	155.3	163.2	121.9	156.1	47.4	46.3	
Std Dv	.29	.24	.77	.64	.25	.23	.56	.15	11.0	3.6	15.5	.0	12.0	6.1	.0	
90% CI	.24	.20	.63	.53	.21	.19	.46	.13	9.0	2.9	12.8	.0	9.9	5.0	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-J-1-2

ENSTROM 280FX HELICOPTER
(PISTON ENGINE)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/26/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh																
DP48	83.24	80.58	72.26	85.56	.38	.21	.22	-.41	97.3	152.4	153.7	121.9	150.0	55.6	51.4	N-S
DP49	83.38	80.48	72.83	86.13	.51	.33	-.87	-.48	87.8	154.3	154.4	121.9	148.9	43.7	51.4	S-N
Avg.	83.31	80.53	72.54	85.85	.44	.27	-.32	-.44	92.6	153.4	154.0	121.9	149.4	49.7	51.4	
Std Dv	.10	.07	.40	.40	.09	.08	.77	.05	6.7	1.3	.5	.0	.8	8.4	.0	
90% CI	.44	.32	1.80	1.80	.41	.38	3.44	.22	30.0	6.0	2.2	.0	3.5	37.6	.0	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh																
DP51	83.40	80.23	72.65	85.93	.42	.23	.59	-.29	90.8	152.7	152.7	121.9	148.8	48.4	41.2	N-S
DP52	83.03	79.97	71.31	84.97	-.03	-.18	-.27	-.35	88.3	146.3	146.4	121.9	148.8	38.1	41.2	S-N
Avg.	83.21	80.10	71.98	85.45	.19	.02	.16	-.32	89.6	149.5	149.5	121.9	148.8	43.3	41.2	
Std Dv	.26	.18	.95	.68	.32	.29	.61	.04	1.8	4.5	4.5	.0	.0	7.3	.0	
90% CI	1.17	.82	4.23	3.03	1.42	1.29	2.72	.19	7.9	20.2	19.9	.0	.0	32.5	.0	
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh																
DP53	82.67	79.58	69.71	83.33	.30	.17	.54	-.20	116.6	151.8	169.8	121.9	166.4	41.7	36.0	N-S
DP54	83.21	80.18	70.72	84.24	.22	.02	-.34	-.20	96.2	149.4	150.3	121.9	149.6	33.4	36.0	S-N
Avg.	82.94	79.88	70.21	83.79	.26	.09	.10	-.20	106.4	150.6	160.1	121.9	158.0	37.6	36.0	
Std Dv	.38	.42	.71	.64	.06	.11	.62	.00	14.4	1.7	13.8	.0	11.9	5.9	.0	
90% CI	1.70	1.89	3.19	2.87	.25	.47	2.78	.00	64.4	7.6	61.6	.0	53.0	26.2	.0	
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh																
DP55	83.30	80.06	71.99	85.21	.75	.47	.61	-.10	89.1	159.3	159.4	148.8	148.8	38.1	30.9	N-S
DP57	83.35	80.13	70.07	83.50	-.22	-.35	-.31	-.08	98.3	143.6	145.1	148.8	150.3	27.8	30.9	S-N
Avg.	83.32	80.10	71.03	84.35	.26	.06	.15	-.09	93.7	151.5	152.3	148.8	149.6	32.9	30.9	
Std Dv	.04	.05	1.36	1.21	.69	.58	.65	.01	6.5	11.1	10.1	.0	1.1	7.3	.0	
90% CI	.16	.22	6.06	5.40	3.06	2.59	2.90	.06	29.0	49.6	45.1	.0	4.7	32.5	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-J-2-1

ENSTROM 280FX HELICOPTER
(PISTON ENGINE)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/26/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 50.4 kts																
BP9	86.10	83.73	73.21	86.07	-.25	-.76	.98	.00	84.0	188.6	189.7	191.0	192.0	31.9	25.7	N-S
BP10	85.98	83.52	72.56	84.96	-.50	-.69	1.04	.00	58.2	183.4	215.9	191.0	224.8	31.4	25.7	N-S
BP11	85.98	83.76	73.72	86.05	-.15	-.37	.94	.00	92.1	190.6	190.8	191.0	191.1	31.9	25.7	N-S
BP12	86.17	84.16	73.64	85.87	-.53	-.48	1.11	.00	71.3	183.4	193.7	191.0	201.7	31.9	25.7	N-S
BP13	85.66	83.33	72.53	84.90	-.07	-.28	.86	.00	58.9	191.2	223.2	191.0	223.0	31.4	25.7	N-S
BP14	85.84	83.30	72.16	85.14	-.41	-.89	1.08	.00	84.1	184.6	185.6	191.0	192.0	31.9	25.7	N-S
Avg.	85.95	83.63	72.97	85.50	-.32	-.58	1.00	.00	74.8	187.0	199.8	191.0	204.1	31.7	25.7	
Std Dv	.18	.32	.65	.56	.19	.24	.09	.00	14.2	3.6	15.7	.0	15.8	.3	.0	
90% CI	.15	.26	.53	.46	.16	.20	.08	.00	11.7	3.0	12.9	.0	13.0	.2	.0	
TAKEOFF -- TARGET IAS 50.4 kts																
CP22	85.53	82.40	70.36	83.13	.21	-.26	.77	.00	88.9	194.6	194.7	189.8	189.8	30.9	25.2	N-S
CP23	85.49	83.01	71.87	85.12	.37	.24	.80	.00	108.6	196.6	207.5	189.8	200.2	31.4	25.2	N-S
CP24	85.31	82.89	71.83	84.61	.64	.46	.46	.00	90.6	202.0	202.0	189.8	189.8	29.8	25.2	N-S
CP25	85.52	82.67	71.37	84.68	.55	.46	.33	.00	95.7	201.1	202.1	189.8	190.7	28.8	25.2	N-S
CP26	84.90	81.82	69.98	83.61	.22	-.22	.54	.00	109.4	195.2	206.9	189.8	201.2	29.3	25.2	N-S
CP27	84.63	81.88	70.21	83.18	.15	.10	.72	.00	94.6	193.8	194.4	189.8	190.4	30.3	25.2	N-S
Avg.	85.23	82.44	70.94	84.06	.36	.13	.60	.00	98.0	197.2	201.3	189.8	193.7	30.1	25.2	
Std Dv	.38	.51	.85	.85	.20	.32	.19	.00	8.9	3.5	5.7	.0	5.5	1.0	.0	
90% CI	.31	.42	.70	.70	.16	.26	.16	.00	7.3	2.9	4.7	.0	4.5	.8	.0	
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh																
AP42	80.31	78.46	70.42	81.89	.27	.17	.40	-1.06	99.7	216.0	219.1	211.2	214.3	52.0	46.3	N-S
AP43	82.98	80.75	72.19	84.36	-.02	-.11	-.55	-.47	94.0	210.4	210.9	211.2	211.7	40.6	46.3	S-N
AP44	79.62	77.84	70.46	82.59	.43	.28	.57	-1.45	111.2	218.3	234.2	211.2	226.6	54.5	46.3	N-S
AP45	83.20	81.13	73.03	85.36	.28	.19	-.35	-1.15	102.6	216.4	221.7	211.2	216.4	43.7	46.3	S-N
AP46	-	78.81	70.90	82.22	.44	.31	.34	-.88	109.2	219.1	232.0	211.2	223.7	52.0	46.3	N-S
AP47	82.36	79.97	72.16	84.30	.60	.45	-.67	-1.22	95.9	221.8	223.0	211.2	212.3	41.7	46.3	S-N
Avg.	81.69	79.49	71.53	83.45	.33	.21	-.04	-1.02	102.1	217.0	223.5	211.2	217.5	47.4	46.3	
Std Dv	1.63	1.32	1.08	1.41	.21	.19	.54	.33	7.0	3.8	8.6	.0	6.2	6.1	.0	
90% CI	1.55	1.09	.89	1.16	.17	.15	.44	.27	5.7	3.2	7.1	.0	5.1	5.0	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

TABLE B-J-2-2

ENSTROM 280FX HELICOPTER
(PISTON ENGINE)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/26/91

EV	CORRECTED (dB) EPNL	SEL	ALm	PNLTm	CORRECTIONS (dB) /\1(P)	/\1(A)	/\2	/\3	ACOUSTIC ANGLE (Deg)	TRACKING DATA (Meters) (ACTUAL) CPA	SR	(REFERENCE) CPAR	SRR	SPEED(m/sec) GRND	REF	DIR
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh																
DP48	80.18	79.12	71.14	82.60	.30	.16	.24	-.89	85.1	215.7	216.5	211.2	212.0	55.6	51.4	N-S
DP49	83.76	81.06	73.27	86.33	.51	.20	-.89	-1.05	102.9	220.3	226.0	211.2	216.7	43.7	51.4	S-N
Avg.	82.28	80.09	72.21	84.46	.41	.18	-.32	-.97	94.0	218.0	221.3	211.2	214.4	49.7	51.4	
Std Dv	2.09	1.37	1.51	2.64	.15	.03	.80	.11	12.6	3.3	6.7	.0	3.3	8.4	.0	
90% CI	9.31	6.12	6.72	11.78	.66	.13	3.57	.51	56.2	14.5	30.0	.0	14.8	37.6	.0	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh																
DP51	80.55	78.55	69.58	81.22	.18	.05	.66	-.64	94.8	213.2	213.9	211.2	212.0	48.4	41.2	N-S
DP52	82.55	79.55	70.71	83.73	-.13	-.94	-.25	-.84	115.9	207.1	230.2	211.2	234.7	38.1	41.2	S-N
Avg.	81.55	79.03	70.15	82.48	.03	-.44	.20	-.74	105.4	210.1	222.0	211.2	223.4	43.3	41.2	
Std Dv	1.41	.68	.80	1.77	.22	.70	.64	.14	14.9	4.3	11.5	.0	16.1	7.3	.0	
90% CI	6.31	3.03	3.57	7.92	.98	3.13	2.87	.63	66.6	19.3	51.5	.0	71.7	32.5	.0	
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh																
DP53	79.81	77.43	67.38	79.24	.31	-.16	.55	-.47	107.8	215.3	226.1	211.2	221.8	41.7	36.0	N-S
DP54	83.13	80.65	71.17	83.74	.25	.10	-.38	-.53	92.8	214.0	214.3	211.2	211.5	33.4	36.0	S-N
Avg.	81.47	79.04	69.27	81.49	.28	-.03	.09	-.50	100.3	214.6	220.2	211.2	216.6	37.6	36.0	
Std Dv	2.35	2.28	2.68	3.18	.04	.18	.66	.04	10.6	.9	8.3	.0	7.3	5.9	.0	
90% CI	10.48	10.17	11.97	14.21	.19	.82	2.94	.19	47.4	4.1	37.3	.0	32.5	26.2	.0	
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh																
DP55	79.91	78.23	69.20	81.20	.71	.56	.64	-.26	82.7	224.8	226.6	211.2	213.0	38.1	30.9	N-S
DP57	82.56	79.46	69.15	82.34	-.05	-.55	-.38	-.28	101.8	207.6	212.1	211.2	215.8	27.8	30.9	S-N
Avg.	81.24	78.85	69.18	81.77	.33	.00	.13	-.27	92.3	216.2	219.4	211.2	214.4	32.9	30.9	
Std Dv	1.87	.87	.04	.81	.54	.78	.72	.01	13.5	12.2	10.3	.0	2.0	7.3	.0	
90% CI	8.37	3.88	.16	3.60	2.40	3.50	3.22	.06	60.3	54.3	45.8	.0	8.8	32.5	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

TABLE B-J-3-1

ENSTROM 280FX HELICOPTER
(PISTON ENGINE)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/26/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 50.4 kts																
BP9	83.46	80.46	69.53	83.06	-.21	-.20	.96	.00	79.1	189.6	193.1	191.0	194.5	31.9	25.7	N-S
BP10	84.21	81.19	70.01	83.35	.07	-.20	.81	.00	80.3	193.1	195.9	191.0	193.8	31.4	25.7	N-S
BP11	83.40	80.47	69.38	82.81	.21	.08	.82	.00	91.8	195.8	195.9	191.0	191.0	31.9	25.7	N-S
BP12	83.83	80.91	70.30	83.68	.15	.05	.85	.00	86.0	194.5	195.0	191.0	191.4	31.9	25.7	N-S
BP13	83.52	80.58	70.17	83.29	-.52	-.55	1.06	.00	94.6	182.3	182.9	191.0	191.6	31.4	25.7	N-S
BP14	84.18	81.14	69.69	83.18	.00	-.10	.92	.00	84.1	191.4	192.4	191.0	192.0	31.9	25.7	N-S
Avg.	83.77	80.79	69.85	83.23	-.05	-.15	.90	.00	86.0	191.1	192.5	191.0	192.4	31.7	25.7	
Std Dv	.36	.33	.37	.29	.27	.23	.10	.00	6.2	4.8	4.9	.0	1.4	.3	.0	
90% CI	.30	.27	.30	.24	.22	.19	.08	.00	5.1	4.0	4.1	.0	1.2	.2	.0	
TAKEOFF -- TARGET IAS 50.4 kts																
CP22	87.93	84.73	73.19	87.22	.15	.11	.54	.00	101.7	205.2	209.5	189.8	204.4	30.9	25.2	N-S
CP23	88.28	85.19	74.31	88.20	.16	.07	.87	.00	104.8	193.4	200.0	189.8	196.3	31.4	25.2	N-S
CP24	87.83	85.20	72.98	86.18	.09	.04	.66	.00	111.9	192.7	207.6	189.8	204.4	29.8	25.2	N-S
CP25	88.02	84.50	73.62	87.84	.17	-.08	.50	.00	100.4	193.2	196.4	189.8	192.9	28.8	25.2	N-S
CP26	88.14	84.95	74.00	87.92	.27	.17	.54	.00	109.4	195.2	207.0	189.8	201.2	29.3	25.2	N-S
CP27	88.37	84.61	73.20	87.34	.44	-.05	.61	.00	118.0	198.9	225.2	189.8	214.9	30.3	25.2	N-S
Avg.	88.09	84.86	73.55	87.45	.21	.04	.62	.00	107.7	196.4	207.6	189.8	202.3	30.1	25.2	
Std Dv	.21	.30	.52	.72	.13	.10	.14	.00	6.7	4.9	10.0	.0	7.7	1.0	.0	
90% CI	.17	.24	.43	.59	.10	.08	.11	.00	5.5	4.0	8.2	.0	6.3	.8	.0	
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh																
AP42	82.78	80.48	72.95	85.47	.16	.08	.45	-1.11	106.2	213.8	222.7	211.2	220.0	52.0	46.3	N-S
AP43	80.65	78.97	70.72	82.30	.31	.21	-.68	-.44	104.0	216.8	223.4	211.2	217.7	40.6	46.3	S-N
AP44	82.27	80.04	72.83	84.85	.04	-.03	.70	-1.51	77.1	211.5	217.0	211.2	216.7	54.5	46.3	N-S
AP45	80.11	77.89	70.13	82.18	.03	-.54	-.24	-1.10	113.3	210.8	229.5	211.2	229.9	43.7	46.3	S-N
AP46	82.84	80.75	72.58	84.35	.42	.32	.34	-.92	96.8	219.1	220.6	211.2	212.7	52.0	46.3	N-S
AP47	80.20	78.53	70.75	82.65	.29	.19	-.35	-1.07	112.1	216.4	233.5	211.2	227.9	43.7	46.3	S-N
Avg.	81.47	79.44	71.66	83.63	.21	.04	.04	-1.02	101.6	214.7	224.4	211.2	220.8	47.8	46.3	
Std Dv	1.29	1.15	1.26	1.43	.16	.31	.54	.35	13.4	3.3	6.0	.0	6.7	5.8	.0	
90% CI	1.06	.95	1.04	1.18	.13	.25	.44	.29	11.0	2.7	5.0	.0	5.5	4.7	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-J-3-2

ENSTROM 280FX HELICOPTER (PISTON ENGINE)

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/26/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh																
DP48	84.20	82.01	74.31	86.71	.09	-.01	.32	-.92	100.1	211.9	215.2	211.2	214.5	55.6	51.4	N-S
DP49	80.41	78.72	71.47	83.24	.15	.02	-.74	-1.03	103.6	212.6	218.7	211.2	217.3	43.7	51.4	S-N
Avg.	82.31	80.37	72.89	84.97	.12	.00	-.21	-.98	101.8	212.3	216.9	211.2	215.9	49.7	51.4	
Std Dv	2.68	2.33	2.01	2.45	.04	.02	.75	.08	2.5	.5	2.5	.0	2.0	8.4	.0	
90% CI	11.97	10.39	8.97	10.95	.19	.09	3.35	.35	11.0	2.2	11.0	.0	8.8	37.6	.0	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh																
DP51	83.15	80.86	72.62	84.88	.26	.13	.63	-.69	100.9	214.9	218.9	211.2	215.1	48.4	41.2	N-S
DP52	79.99	77.94	69.46	81.11	.26	-.25	-.40	-.79	86.9	214.0	214.4	211.2	211.5	38.1	41.2	S-N
Avg.	81.57	79.40	71.04	82.99	.26	-.06	.11	-.74	93.9	214.4	216.6	211.2	213.3	43.3	41.2	
Std Dv	2.23	2.06	2.23	2.67	.00	.27	.73	.07	9.9	.6	3.2	.0	2.5	7.3	.0	
90% CI	9.98	9.22	9.98	11.90	.00	1.20	3.25	.32	44.2	2.8	14.2	.0	11.4	32.5	.0	
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh																
DP53	-	75.66	70.03	82.40	.15	-.03	.63	-.53	81.1	211.5	214.1	211.2	213.8	41.7	36.0	N-S
DP54	80.19	78.43	68.30	80.34	-.04	-.14	.34	-.47	120.7	209.3	243.3	211.2	245.5	38.6	36.0	S-N
Avg.	80.19	77.04	69.17	81.37	.06	-.09	.49	-.50	100.9	210.4	228.7	211.2	229.6	40.2	36.0	
Std Dv	0.00	1.96	1.22	1.46	.13	.08	.21	.04	28.0	1.6	20.6	.0	22.4	2.2	.0	
90% CI	0.00	8.74	5.46	6.50	.60	.35	.92	.19	125.0	6.9	92.2	.0	100.1	9.8	.0	
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh																
DP55	82.03	79.87	70.19	82.02	.01	.03	.88	-.33	92.9	212.7	212.9	211.2	211.5	38.1	30.9	N-S
DP57	79.64	77.65	67.43	79.06	-.07	-.38	-.38	-.21	105.4	207.6	215.3	211.2	219.1	27.8	30.9	S-N
Avg.	80.83	78.76	68.81	80.54	-.03	-.17	.25	-.27	99.2	210.1	214.1	211.2	215.3	32.9	30.9	
Std Dv	1.69	1.57	1.95	2.09	.06	.29	.89	.08	8.8	3.6	1.7	.0	5.4	7.3	.0	
90% CI	7.55	7.01	8.71	9.34	.25	1.29	3.98	.38	39.5	16.1	7.6	.0	24.0	32.5	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-K-1-1

ENSTROM TH28 HELICOPTER
(TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/26/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 55.0 kts																
BT1	91.55	89.86	80.69	93.06	.47	.46	.26	.00	108.9	125.4	132.5	118.2	124.9	31.9	28.3	N-S
BT2	91.83	89.69	82.08	94.41	-.67	-.64	.99	.00	110.8	111.3	119.0	118.2	126.4	33.4	28.3	N-S
BT4	92.01	90.06	81.91	94.02	.18	.06	.41	.00	97.3	121.1	122.1	118.2	119.2	31.9	28.3	N-S
BT5	91.78	89.76	81.08	93.07	.27	.26	.50	.00	113.9	122.8	134.3	118.2	129.3	32.9	28.3	N-S
BT6	91.77	89.99	80.56	92.72	-.27	-.43	.75	.00	107.2	115.9	121.3	118.2	123.7	32.9	28.3	N-S
BT7	91.20	89.13	80.61	92.79	-.52	-.51	.87	.00	108.2	112.7	118.6	118.2	124.4	32.9	28.3	N-S
Avg.	91.69	89.75	81.15	93.35	-.09	-.13	.63	.00	107.7	118.2	124.6	118.2	124.7	32.6	28.3	
Std Dv	.28	.33	.68	.70	.46	.45	.28	.00	5.6	5.7	6.9	.0	3.3	.6	.0	
90% CI	.23	.27	.56	.58	.38	.37	.23	.00	4.6	4.7	5.7	.0	2.7	.5	.0	
TAKEOFF -- TARGET IAS 55.0 kts																
CT16	90.37	86.84	77.66	91.34	-.70	-.72	.81	.00	100.6	122.3	124.4	121.9	132.7	31.4	27.8	N-S
CT17	90.06	86.74	77.85	91.77	-.04	-.06	.44	.00	97.8	131.0	132.3	121.9	131.6	30.9	27.8	N-S
CT18	90.04	86.80	78.86	92.52	.15	.12	.43	.00	114.2	133.5	146.4	121.9	143.0	31.4	27.8	N-S
CT19	90.03	86.42	77.97	91.92	.10	.04	.32	.00	99.0	132.4	134.0	121.9	132.0	30.3	27.8	N-S
CT20	89.50	86.38	77.57	91.35	-.18	-.26	.29	.00	93.0	128.7	128.9	121.9	130.6	29.3	27.8	N-S
CT21	90.14	86.72	78.12	91.95	.28	.07	.46	.00	111.2	134.6	144.3	121.9	139.8	31.9	27.8	N-S
Avg.	90.02	86.65	78.01	91.81	-.07	-.14	.46	.00	102.6	130.4	135.1	121.9	134.9	30.9	27.8	
Std Dv	.29	.20	.46	.44	.35	.32	.19	.00	8.3	4.5	8.7	.0	5.1	.9	.0	
90% CI	.24	.16	.38	.36	.29	.26	.15	.00	6.8	3.7	7.1	.0	4.2	.8	.0	
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh																
AT28	85.23	82.53	74.14	87.24	-.02	-.09	.16	.54	84.5	148.0	148.7	121.9	149.4	47.8	46.3	N-S
AT29	85.80	83.13	75.22	88.10	.08	.02	-.43	.70	80.9	149.8	151.7	121.9	150.6	42.2	46.3	S-N
AT30	85.57	83.01	74.27	86.56	-.56	-.57	.66	.79	112.4	140.6	152.1	121.9	160.9	50.9	46.3	N-S
AT31	85.22	82.51	74.28	87.18	.06	.00	-.27	.54	99.2	149.4	151.3	121.9	150.7	43.7	46.3	S-N
AT32	85.48	82.82	73.70	86.75	-.23	-.31	.44	1.12	96.7	145.1	146.1	121.9	149.8	49.9	46.3	N-S
AT33	85.01	82.24	74.31	87.45	.58	.45	-.33	.34	90.7	156.7	156.7	121.9	148.8	45.3	46.3	S-N
Avg.	85.39	82.71	74.32	87.21	-.02	-.08	.04	.67	94.1	148.3	151.1	121.9	151.7	46.6	46.3	
Std Dv	.29	.34	.50	.55	.38	.34	.45	.27	11.4	5.4	3.6	.0	4.6	3.5	.0	
90% CI	.23	.28	.41	.45	.31	.28	.37	.22	9.3	4.4	2.9	.0	3.8	2.9	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

April 19, 1993

TABLE B-K-1-2

ENSTROM TH28 HELICOPTER
(TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/26/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh																
DT34	88.16	85.02	75.90	88.80	-.12	-.29	.24	2.03	97.8	144.9	146.3	121.9	150.1	53.0	51.4	N-S
DT35	88.60	85.58	76.90	90.00	-.52	-.56	-.03	2.07	90.3	140.8	140.8	121.9	148.7	48.4	51.4	S-N
Avg.	88.38	85.30	76.40	89.40	-.32	-.43	.10	2.05	94.1	142.9	143.6	121.9	149.4	50.7	51.4	
Std Dv	.31	.40	.71	.85	.28	.19	.19	.03	5.3	2.9	3.9	.0	1.0	3.3	.0	
90% CI	1.39	1.77	3.16	3.79	1.26	.85	.85	.13	23.7	12.9	17.4	.0	4.4	14.5	.0	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh																
DT36	84.79	81.96	73.96	87.06	.42	.25	.33	.19	99.4	153.4	155.5	121.9	150.8	45.8	41.2	N-S
DT37	84.94	81.94	73.50	86.90	.05	-.28	-.31	.20	96.8	147.8	148.9	121.9	149.8	38.1	41.2	S-N
Avg.	84.86	81.95	73.73	86.98	.23	-.02	.01	.19	98.1	150.6	152.2	121.9	150.3	41.9	41.2	
Std Dv	.11	.01	.33	.11	.26	.37	.45	.01	1.8	4.0	4.7	.0	.7	5.4	.0	
90% CI	.47	.06	1.45	.51	1.17	1.67	2.02	.03	8.2	17.7	20.8	.0	3.2	24.3	.0	
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh																
DT38	84.15	81.33	72.54	86.13	.40	.23	.41	-.06	104.2	153.1	157.9	121.9	153.4	40.6	36.0	N-S
DT39	84.28	81.58	73.14	86.21	.65	.37	-.79	-.02	79.3	157.9	160.7	121.9	151.4	31.9	36.0	S-N
Avg.	84.22	81.46	72.84	86.17	.52	.30	-.19	-.04	91.8	155.5	159.3	121.9	152.4	36.3	36.0	
Std Dv	.09	.18	.42	.06	.18	.10	.85	.03	17.6	3.4	2.0	.0	1.4	6.2	.0	
90% CI	.41	.79	1.89	.25	.79	.44	3.79	.13	78.6	15.2	8.8	.0	6.3	27.5	.0	
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh																
DT40	85.67	82.91	74.38	87.54	1.57	1.29	-.02	.24	112.9	172.1	186.8	121.9	161.4	35.5	30.9	N-S
DT41	84.51	81.56	72.79	86.16	-.35	-.50	-.34	-.08	105.9	141.9	147.6	121.9	154.7	27.3	30.9	S-N
Avg.	85.09	82.24	73.58	86.85	.61	.39	-.18	.08	109.4	157.0	167.2	121.9	158.0	31.4	30.9	
Std Dv	.82	.95	1.12	.98	1.36	1.27	.23	.23	4.9	21.4	27.7	.0	4.7	5.8	.0	
90% CI	3.66	4.26	5.02	4.36	6.06	5.65	1.01	1.01	22.1	95.3	123.8	.0	21.2	25.9	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

TABLE B-K-2-1

ENSTROM TH38 HELICOPTER
(TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/26/91

EV	CORRECTED (dB) EPNL	SEL	ALm	PNLTm	CORRECTIONS (dB) /\1(P)	/\1(A)	/\2	/\3	ACOUSTIC ANGLE (Deg)	TRACKING DATA (Meters) (ACTUAL) CPA	SR	(REFERENCE) CPAR	SRR	SPEED(m/sec) GRND	REF	DIR
APPROACH -- TARGET IAS 55.0 kts																
BT1	88.15	85.98	75.69	88.71	-.39	-.37	.62	.00	68.0	186.6	201.3	191.0	205.9	31.9	28.3	N-S
BT2	88.22	86.49	75.12	87.74	-.75	-.69	.99	.00	90.7	180.0	180.0	191.0	191.0	33.4	28.3	N-S
BT4	87.72	85.47	74.70	87.67	-.36	-.51	.60	.00	73.5	187.5	195.5	191.0	199.1	31.9	28.3	N-S
BT5	87.74	85.69	75.48	88.31	-.35	-.38	.75	.00	79.9	187.1	190.0	191.0	193.9	32.9	28.3	N-S
BT6	86.94	85.03	74.71	87.52	-.66	-.60	.88	.00	78.5	181.7	185.3	191.0	194.8	32.9	28.3	N-S
BT7	87.61	85.54	75.53	88.31	-.63	-.58	.87	.00	78.9	182.1	185.6	191.0	194.6	32.9	28.3	N-S
Avg.	87.73	85.70	75.20	88.04	-.52	-.52	.79	.00	78.3	184.2	189.6	191.0	196.6	32.6	28.3	
Std Dv	.46	.50	.43	.47	.18	.13	.16	.00	7.6	3.3	7.7	.0	5.3	.6	.0	
90% CI	.38	.41	.35	.38	.15	.10	.13	.00	6.2	2.7	6.4	.0	4.3	.5	.0	
TAKEOFF -- TARGET IAS 55.0 kts																
CT16	87.06	84.25	72.87	85.86	-.73	-.70	.78	.00	108.9	187.5	198.2	198.7	210.0	31.4	27.8	N-S
CT17	86.93	84.46	73.45	86.10	-.27	-.27	.52	.00	102.6	196.1	201.0	198.7	203.6	30.9	27.8	N-S
CT18	87.08	84.53	74.05	86.83	-.47	-.47	.68	.00	106.0	192.2	199.9	198.7	206.7	31.4	27.8	N-S
CT19	86.70	83.64	72.65	86.17	-.50	-.86	.54	.00	111.8	191.4	206.2	198.7	214.1	30.3	27.8	N-S
CT20	85.96	83.46	72.14	84.97	-.40	-.39	.35	.00	94.7	193.2	193.9	198.7	199.4	29.3	27.8	N-S
CT21	86.73	83.88	71.94	85.23	-.26	-.50	.70	.00	98.9	194.3	196.7	198.7	201.1	31.9	27.8	N-S
Avg.	86.74	84.04	72.85	85.86	-.44	-.53	.59	.00	103.8	192.4	199.3	198.7	205.8	30.9	27.8	
Std Dv	.42	.44	.80	.68	.17	.21	.16	.00	6.4	2.9	4.2	.0	5.6	.9	.0	
90% CI	.34	.36	.66	.56	.14	.18	.13	.00	5.2	2.4	3.5	.0	4.6	.8	.0	
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh																
AT28	84.45	82.25	72.56	84.55	-.57	-.71	.38	.64	97.5	199.8	201.5	211.2	213.0	47.8	46.3	N-S
AT29	85.55	82.92	73.79	86.67	.26	.02	-.50	.69	108.4	216.0	227.6	211.2	222.6	42.2	46.3	S-N
AT30	84.75	82.64	73.05	85.22	-.65	-.70	.69	.96	90.2	198.1	198.1	211.2	211.2	50.9	46.3	N-S
AT31	84.75	81.73	71.64	84.55	.35	.05	-.31	.52	105.3	214.0	221.9	211.2	219.0	43.7	46.3	S-N
AT32	85.27	83.24	73.31	85.50	-.24	-.31	.44	1.48	92.4	206.0	206.2	211.2	211.4	49.9	46.3	N-S
AT33	84.71	82.10	72.33	84.81	.47	.30	-.27	.32	100.0	219.4	222.8	211.2	214.5	45.3	46.3	S-N
Avg.	84.91	82.48	72.78	85.22	-.06	-.23	.07	.77	99.0	208.9	213.0	211.2	215.3	46.6	46.3	
Std Dv	.41	.56	.76	.81	.49	.42	.49	.41	7.1	8.9	12.6	.0	4.6	3.5	.0	
90% CI	.34	.46	.63	.66	.40	.34	.40	.33	5.8	7.3	10.3	.0	3.8	2.9	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department of Transportation

Volpe Center Acoustics Facility

April 19, 1993

TABLE B-K-2-2

ENSTROM TH38 HELICOPTER (TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/26/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh																
DT34	86.79	84.56	73.95	86.14	-.79	-1.07	.42	2.15	63.6	197.5	220.6	211.2	235.9	53.0	51.4	N-S
DT35	88.29	85.31	74.06	86.61	.05	-.01	-.29	1.84	93.7	212.3	212.7	211.2	211.7	48.4	51.4	S-N
Avg.	87.54	84.93	74.00	86.38	-.37	-.54	.06	2.00	78.6	204.9	216.6	211.2	223.8	50.7	51.4	
Std Dv	1.06	.53	.08	.33	.59	.75	.50	.22	21.3	10.5	5.6	.0	17.1	3.3	.0	
90% CI	4.74	2.37	.35	1.48	2.65	3.35	2.24	.98	95.0	46.7	24.9	.0	76.4	14.5	.0	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh																
DT36	83.26	81.18	70.67	83.30	.11	-.03	.44	.33	111.6	212.1	228.1	211.2	227.1	45.8	41.2	N-S
DT37	83.38	80.87	71.86	84.31	.02	-.10	-.32	.27	92.8	210.4	210.6	211.2	211.5	38.1	41.2	S-N
Avg.	83.32	81.02	71.26	83.81	.06	-.06	.06	.30	102.2	211.3	219.4	211.2	219.3	41.9	41.2	
Std Dv	.08	.22	.84	.71	.06	.05	.54	.04	13.3	1.2	12.4	.0	11.0	5.4	.0	
90% CI	.38	.98	3.76	3.19	.28	.22	2.40	.19	59.4	5.4	55.2	.0	49.2	24.3	.0	
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh																
DT38	82.43	80.24	69.83	82.18	.07	-.19	.53	.18	76.9	211.3	216.9	211.2	216.8	40.6	36.0	N-S
DT39	82.93	80.45	69.99	82.42	.28	.11	-.62	.07	97.6	215.5	217.4	211.2	213.1	31.9	36.0	S-N
Avg.	82.68	80.35	69.91	82.30	.17	-.04	-.05	.13	87.3	213.4	217.1	211.2	215.0	36.3	36.0	
Std Dv	.35	.15	.11	.17	.15	.21	.81	.08	14.6	3.0	.4	.0	2.6	6.2	.0	
90% CI	1.58	.66	.51	.76	.66	.95	3.63	.35	65.3	13.3	1.6	.0	11.7	27.5	.0	
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh																
DT40	82.06	80.03	69.61	81.96	.69	.46	.38	-.10	118.1	222.8	252.6	211.2	239.5	35.5	30.9	N-S
DT41	82.11	79.99	69.70	82.39	-.51	-.55	-.33	-.01	96.4	201.1	202.3	211.2	212.5	27.3	30.9	S-N
Avg.	82.09	80.01	69.65	82.18	.09	-.05	.02	-.05	107.3	212.0	227.5	211.2	226.0	31.4	30.9	
Std Dv	.04	.03	.06	.30	.85	.71	.50	.06	15.3	15.3	35.6	.0	19.1	5.8	.0	
90% CI	.16	.13	.28	1.36	3.79	3.19	2.24	.28	68.5	68.5	158.8	.0	85.2	25.9	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

TABLE B-K-3-1

ENSTROM TH28 HELICOPTER
(TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/26/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 55.0 kts																
BT1	84.79	82.47	71.31	84.38	.50	.45	.23	.00	91.1	204.0	204.0	191.0	191.0	31.9	28.3	N-S
BT2	83.63	81.42	69.90	82.04	-.06	-.11	.68	.00	100.2	193.2	196.3	191.0	194.0	33.4	28.3	N-S
BT4	84.92	82.27	71.02	83.90	.22	.18	.36	.00	97.1	197.9	199.5	191.0	192.4	31.9	28.3	N-S
BT5	84.41	81.25	70.32	84.02	.34	-.30	.45	.00	84.9	200.3	201.1	191.0	191.7	32.9	28.3	N-S
BT6	84.09	81.26	69.25	82.37	.18	-.16	.52	.00	83.7	197.1	198.3	191.0	192.1	32.9	28.3	N-S
BT7	84.35	81.90	70.47	83.54	-.04	-.13	.62	.00	83.9	192.9	193.9	191.0	192.0	32.9	28.3	N-S
Avg.	84.56	81.76	70.38	83.38	.19	-.01	.48	.00	90.2	197.6	198.8	191.0	192.2	32.6	28.3	
Std Dv	.47	.53	.75	.95	.22	.28	.17	.00	7.2	4.2	3.6	.0	1.0	.6	.0	
90% CI	.39	.44	.61	.78	.18	.23	.14	.00	5.9	3.5	2.9	.0	.8	.5	.0	
TAKEOFF -- TARGET IAS 55.0 kts																
CT16	86.93	83.29	72.09	86.10	-.12	-.28	.52	.00	118.8	199.3	227.4	198.7	226.7	31.4	27.8	N-S
CT17	87.77	84.19	73.27	86.97	.17	.16	.33	.00	109.8	204.9	217.7	198.7	211.1	30.9	27.8	N-S
CT18	87.52	83.80	73.30	87.11	.39	.29	.31	.00	115.6	209.1	231.7	198.7	220.3	31.4	27.8	N-S
CT19	88.16	84.20	73.93	87.71	.36	.13	.18	.00	116.9	208.3	233.6	198.7	222.8	30.3	27.8	N-S
CT20	86.55	82.80	71.39	85.72	.09	-.19	.16	.00	113.8	202.0	220.7	198.7	217.1	29.3	27.8	N-S
CT21	86.46	81.95	70.99	85.55	.06	-.85	.53	.00	121.4	202.0	236.7	198.7	232.9	31.9	27.8	N-S
Avg.	87.23	83.37	72.49	86.53	.16	-.12	.34	.00	116.1	204.3	228.0	198.7	221.8	30.9	27.8	
Std Dv	.69	.88	1.18	.86	.19	.42	.16	.00	4.0	3.9	7.5	.0	7.6	.9	.0	
90% CI	.57	.73	.97	.71	.16	.34	.13	.00	3.3	3.2	6.2	.0	6.2	.8	.0	
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh																
AT28	84.85	82.20	72.61	85.09	.45	.37	-.06	.52	101.8	221.1	225.9	211.2	215.8	47.8	46.3	N-S
AT29	84.49	82.34	73.03	85.43	-.01	-.24	-.33	.84	92.9	207.8	208.1	211.2	211.5	42.2	46.3	S-N
AT30	85.36	82.63	72.85	85.09	.04	.00	.38	.78	89.5	212.8	212.8	211.2	211.2	50.9	46.3	N-S
AT31	84.15	81.78	72.53	85.14	.02	-.17	-.21	.64	100.4	209.3	212.8	211.2	214.7	43.7	46.3	S-N
AT32	84.63	82.08	71.71	84.07	-.02	-.07	.33	1.19	105.1	211.3	218.9	211.2	218.8	49.9	46.3	N-S
AT33	84.06	81.91	73.97	86.52	.18	.05	-.16	.39	55.5	214.4	260.2	211.2	256.4	45.3	46.3	S-N
Avg.	84.59	82.16	72.78	85.22	.11	-.01	-.01	.73	90.9	212.8	223.1	211.2	221.4	46.6	46.3	
Std Dv	.48	.31	.74	.79	.18	.21	.29	.28	18.3	4.7	19.2	.0	17.4	3.5	.0	
90% CI	.39	.25	.61	.65	.15	.18	.24	.23	15.0	3.9	15.8	.0	14.3	2.9	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

TABLE B-K-3-2

ENSTROM TH38 HELICOPTER
(TURBINE ENGINE)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/26/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh																
DT34	87.65	84.52	74.51	87.19	.38	-.09	-.03	1.80	92.2	219.0	219.2	211.2	211.4	53.0	51.4	N-S
DT35	87.60	85.30	75.12	87.37	-.63	-.66	-.01	2.20	87.8	198.9	199.1	211.2	211.4	48.4	51.4	S-N
Avg.	87.63	84.91	74.82	87.28	-.13	-.38	-.02	2.00	90.0	208.9	209.1	211.2	211.4	50.7	51.4	
Std Dv	.04	.55	.43	.13	.71	.40	.01	.28	3.1	14.2	14.2	.0	.0	3.3	.0	
90% CI	.16	2.46	1.93	.57	3.19	1.80	.06	1.26	13.9	63.5	63.5	.0	.0	14.5	.0	
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh																
DT36	84.05	81.31	71.68	84.27	.40	.18	.35	.26	100.4	216.8	220.5	211.2	214.8	45.8	41.2	N-S
DT37	83.66	81.29	71.06	83.76	.09	-.08	-.33	.35	97.9	210.8	212.8	211.2	213.3	38.1	41.2	S-N
Avg.	83.85	81.30	71.37	84.01	.25	.05	.01	.31	99.2	213.8	216.6	211.2	214.1	41.9	41.2	
Std Dv	.28	.01	.44	.36	.22	.18	.48	.06	1.8	4.2	5.4	.0	1.1	5.4	.0	
90% CI	1.23	.06	1.96	1.61	.98	.82	2.15	.28	7.9	18.9	24.3	.0	4.7	24.3	.0	
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh																
DT38	83.08	80.23	69.52	82.07	.30	.21	.41	.12	93.1	217.3	217.6	211.2	211.5	40.6	36.0	N-S
DT39	82.79	80.62	70.94	83.28	.52	.34	-.71	.10	80.7	220.1	223.0	211.2	214.0	31.9	36.0	S-N
Avg.	82.93	80.43	70.23	82.68	.41	.28	-.15	.11	86.9	218.7	220.3	211.2	212.8	36.3	36.0	
Std Dv	.21	.28	1.00	.86	.16	.09	.79	.01	8.8	2.0	3.8	.0	1.8	6.2	.0	
90% CI	.92	1.23	4.48	3.82	.69	.41	3.54	.06	39.1	8.8	17.0	.0	7.9	27.5	.0	
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh																
DT40	82.63	80.22	69.96	82.77	1.10	.93	.17	-.03	102.0	233.6	238.8	211.2	215.9	35.5	30.9	N-S
DT41	82.49	80.50	70.29	82.30	.11	-.05	-.55	.01	112.7	211.7	229.4	211.2	228.9	27.3	30.9	S-N
Avg.	82.56	80.36	70.13	82.54	.61	.44	-.19	-.01	107.3	222.6	234.1	211.2	222.4	31.4	30.9	
Std Dv	.10	.20	.23	.33	.70	.69	.51	.03	7.6	15.5	6.6	.0	9.2	5.8	.0	
90% CI	.44	.88	1.04	1.48	3.13	3.09	2.27	.13	33.8	69.1	29.7	.0	41.0	25.9	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

U.S. Department of Transportation
Volpe Center
Acoustics Facility

May 6, 1993

TABLE B-L-1-1

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 52.0 kts																
B15	89.30	88.93	78.30	90.38	-.10	-.14	.26	.00	64.7	115.7	127.9	118.2	130.8	27.8	26.7	N-S
B16	91.04	88.97	78.98	91.79	.02	-.29	.15	.00	101.7	116.3	118.8	118.2	120.7	27.3	26.7	N-S
B17	95.15	93.73	84.29	96.01	-.08	-.12	.01	.00	73.3	115.9	120.9	118.2	123.4	26.2	26.7	N-S
B18	94.69	93.15	85.59	96.88	-.78	-.77	-.13	.00	60.0	107.8	124.5	118.2	136.5	23.7	26.7	N-S
B19	90.63	88.82	78.95	90.81	-.20	-.30	-.48	.00	65.0	114.1	125.9	118.2	130.4	23.1	26.7	N-S
B20	93.21	91.89	85.05	96.44	-.55	-.58	-.04	.00	72.8	110.1	115.3	118.2	123.8	24.7	26.7	N-S
B21	93.46	90.95	83.75	95.27	-.34	-1.71	-.82	.00	114.3	112.6	123.5	118.2	129.7	21.1	26.7	N-S
Avg.	92.50	90.92	82.13	93.94	-.29	-.56	-.15	.00	78.8	113.2	122.4	118.2	127.9	24.8	26.7	
Std Dv	2.20	2.08	3.23	2.83	.29	.56	.38	.00	20.8	3.2	4.4	.0	5.5	2.4	.0	
90% CI	1.62	1.53	2.37	2.08	.21	.41	.28	.00	15.3	2.4	3.2	.0	4.0	1.8	.0	
TAKEOFF -- TARGET IAS 52.0 kts																
C22	87.40	83.32	76.65	91.07	-1.63	-1.61	.16	.00	116.4	54.9	61.3	65.9	73.5	23.1	26.7	N-S
C23	86.62	82.64	75.87	90.37	-1.94	-1.86	.47	.00	119.3	53.4	61.2	65.9	75.5	24.2	26.7	N-S
C24	87.08	83.00	76.24	90.83	-1.89	-1.87	.18	.00	127.2	53.4	67.0	65.9	82.6	22.6	26.7	N-S
C25	87.06	83.10	76.40	90.81	-1.36	-1.36	.14	.00	121.2	56.4	66.0	65.9	77.0	23.7	26.7	N-S
C26	86.90	82.79	76.11	90.55	-1.91	-1.87	.56	.00	120.3	53.4	61.8	65.9	76.2	24.7	26.7	N-S
C27	86.86	82.72	76.39	90.72	-.62	-.63	-.70	.00	114.7	61.0	67.2	65.9	72.5	21.1	26.7	N-S
Avg.	86.99	82.93	76.28	90.72	-1.56	-1.53	.14	.00	119.9	55.4	64.1	65.9	76.2	23.2	26.7	
Std Dv	.26	.26	.27	.24	.51	.49	.45	.00	4.4	3.0	2.9	.0	3.6	1.3	.0	
90% CI	.22	.21	.22	.20	.42	.40	.37	.00	3.6	2.5	2.4	.0	2.9	1.1	.0	
150 m FLYOVER -- TARGET IAS 81.9 kts -- 0.9Vh																
A1	80.12	76.25	68.09	82.13	-.46	-.57	-.20	.04	107.9	140.5	147.7	148.8	156.3	38.1	42.2	N-S
A2	80.72	76.67	66.97	80.99	-1.02	-1.50	.53	.04	109.5	133.2	141.3	148.8	157.8	42.7	42.2	S-N
A3	80.20	76.79	67.80	81.33	-.49	-.47	-.18	.04	113.5	139.9	152.5	148.8	162.2	38.1	42.2	N-S
A4	81.58	77.93	68.81	82.94	-1.51	-1.43	.74	.04	105.8	126.8	131.8	148.8	154.6	42.7	42.2	S-N
A5	79.90	76.04	68.59	82.56	-.33	-.32	-.36	.04	109.3	142.2	150.6	148.8	157.6	37.0	42.2	N-S
A9	80.72	76.80	68.64	82.78	-.34	-.42	-.13	.04	97.9	142.1	143.4	148.8	150.2	39.1	42.2	S-N
Avg.	80.54	76.75	68.15	82.12	-.69	-.79	.07	.04	107.3	137.5	144.6	148.8	156.4	39.6	42.2	
Std Dv	.61	.66	.69	.80	.47	.53	.45	.00	5.3	6.2	7.5	.0	4.0	2.5	.0	
90% CI	.50	.54	.57	.66	.39	.44	.37	.00	4.3	5.1	6.2	.0	3.3	2.0	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the *restrictions of FAR Part 36 H36.101c4, see Appendix F.*

U.S. Department of Transportation

Volpe Center Acoustics Facility

May 6, 1993

TABLE B-L-1-2

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 1 CENTERLINE - CENTER 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 91.0 kts -- 1.0Vh																
A6	80.20	76.07	68.15	82.60	-1.64	-1.85	.33	.08	87.4	125.6	125.7	148.8	148.9	42.7	46.8	S-N
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.8Vh																
A8	80.47	76.86	67.24	81.95	-1.53	-1.42	.75	.00	88.5	127.0	127.0	148.8	148.8	38.1	37.6	S-N
A10	80.38	76.82	68.15	82.05	.31	.23	-.83	.00	108.2	150.6	158.5	148.8	156.5	31.4	37.6	N-S
Avg.	80.43	76.84	67.69	82.00	-.61	-.59	-.04	.00	98.3	138.8	142.8	148.8	152.6	34.8	37.6	
Std Dv	.06	.03	.64	.07	1.30	1.17	1.12	.00	13.9	16.7	22.3	.0	5.4	4.7	.0	
90% CI	.28	.13	2.87	.32	5.81	5.21	4.99	.00	62.2	74.5	99.4	.0	24.3	21.2	.0	
150 m FLYOVER -- TARGET IAS 63.7 kts -- 0.7Vh																
A11	82.15	78.52	70.23	83.83	.04	-.02	-.16	-.07	105.1	146.9	152.2	148.8	154.0	31.4	32.9	S-N
A12	81.44	78.49	72.75	85.40	.88	.77	-.90	-.07	107.3	160.0	167.6	148.8	155.8	28.8	32.9	N-S
Avg.	81.79	78.50	71.49	84.62	.46	.38	-.53	-.07	106.2	153.4	159.9	148.8	154.9	30.1	32.9	
Std Dv	.50	.02	1.78	1.11	.59	.56	.52	.00	1.6	9.3	10.9	.0	1.3	1.8	.0	
90% CI	2.24	.09	7.96	4.96	2.65	2.49	2.34	.00	6.9	41.4	48.6	.0	5.7	8.2	.0	
150 m FLYOVER -- TARGET IAS 54.6 kts -- 0.6Vh																
A13	83.62	80.15	70.61	84.18	.58	.44	.29	-.13	102.9	154.3	158.3	148.8	152.6	31.4	28.3	S-N
A14	82.94	79.46	69.74	83.13	1.08	.89	.37	-.13	108.6	161.5	170.4	148.8	157.0	33.4	28.3	N-S
Avg.	83.28	79.81	70.18	83.65	.83	.66	.33	-.13	105.8	157.9	164.4	148.8	154.8	32.4	28.3	
Std Dv	.48	.49	.62	.74	.35	.32	.06	.00	4.0	5.1	8.6	.0	3.1	1.4	.0	
90% CI	2.15	2.18	2.75	3.31	1.58	1.42	.25	.00	18.0	22.7	38.2	.0	13.9	6.3	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

TABLE B-L-2-1

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 52.0 kts																
B15	86.85	84.90	74.92	86.61	.41	-.53	.09	.00	72.7	194.1	203.3	191.0	200.0	27.8	26.7	N-S
B16	87.28	86.15	76.18	86.57	.65	.49	-.01	.00	32.1	194.8	366.4	191.0	359.2	27.3	26.7	N-S
B17	86.99	85.54	76.84	88.52	.41	.29	-.12	.00	47.4	192.6	261.8	191.0	259.5	26.2	26.7	N-S
B18	86.31	82.58	72.28	86.20	.26	-1.47	-.57	.00	80.8	192.9	195.4	191.0	193.4	23.7	26.7	N-S
B19	88.18	86.86	79.15	90.35	.42	.18	-.67	.00	53.6	192.8	239.4	191.0	237.2	23.1	26.7	N-S
B20	84.98	82.06	71.46	85.41	.39	-.59	-.41	.00	39.6	193.5	303.5	191.0	299.4	24.7	26.7	N-S
B21	86.17	83.86	75.23	87.51	.20	.17	-1.04	.00	91.3	191.4	191.4	191.0	191.0	21.1	26.7	N-S
Avg.	86.68	84.56	75.15	87.31	.39	-.21	-.39	.00	59.6	193.2	251.6	191.0	248.5	24.8	26.7	
Std Dv	1.00	1.81	2.64	1.66	.14	.69	.40	.00	22.2	1.1	64.9	.0	63.0	2.4	.0	
90% CI	.74	1.33	1.94	1.22	.10	.51	.30	.00	16.3	.8	47.6	.0	46.2	1.8	.0	
TAKEOFF -- TARGET IAS 52.0 kts																
C22	82.51	79.93	70.83	83.17	.07	-.06	-.52	.00	116.0	159.7	177.7	163.8	182.3	23.1	26.7	N-S
C23	81.77	79.08	69.59	82.96	-.01	-.10	-.32	.00	76.5	159.2	163.7	163.8	168.4	24.2	26.7	N-S
C24	83.07	79.82	71.97	85.00	.00	-.97	-.61	.00	70.3	159.2	169.1	163.8	174.0	22.6	26.7	N-S
C25	82.04	79.56	69.91	82.57	.08	-.03	-.43	.00	91.5	160.2	160.3	163.8	163.8	23.7	26.7	N-S
C26	83.10	80.78	72.20	85.07	.02	-.06	-.23	.00	64.4	159.2	176.5	163.8	181.6	24.7	26.7	N-S
C27	81.72	78.02	69.74	82.75	.29	-.83	-.98	.00	41.3	161.9	245.2	163.8	248.0	21.1	26.7	N-S
Avg.	82.37	79.53	70.71	83.59	.07	-.34	-.51	.00	76.7	159.9	182.1	163.8	186.3	23.2	26.7	
Std Dv	.62	.93	1.15	1.14	.11	.44	.27	.00	25.3	1.1	31.7	.0	31.1	1.3	.0	
90% CI	.51	.76	.95	.94	.09	.36	.22	.00	20.8	.9	26.1	.0	25.5	1.1	.0	
150 m FLYOVER -- TARGET IAS 81.9 kts -- 0.9Vh																
A1	79.26	76.98	67.05	78.75	-.08	-.13	-.33	.08	84.9	205.5	206.3	211.2	212.0	38.1	42.2	N-S
A2	78.74	76.05	65.94	78.92	-.36	-.36	.27	.01	83.1	200.6	202.0	211.2	212.8	42.7	42.2	S-N
A3	78.99	76.49	66.50	79.61	-.04	-.09	-.32	.08	59.7	205.1	237.6	211.2	244.7	38.1	42.2	N-S
A4	79.53	76.82	67.01	79.83	-.47	-.45	.32	.01	97.9	198.7	200.6	211.2	213.2	42.7	42.2	S-N
A5	78.14	75.69	65.88	77.95	-.25	-.27	-.37	.08	87.0	202.2	202.5	211.2	211.5	37.0	42.2	N-S
A9	78.81	75.93	66.83	79.60	.11	.07	-.29	.01	98.6	209.2	211.6	211.2	213.6	39.1	42.2	S-N
Avg.	78.91	76.33	66.54	79.11	-.18	-.20	-.12	.04	85.2	203.6	210.1	211.2	218.0	39.6	42.2	
Std Dv	.48	.52	.52	.71	.22	.19	.32	.04	14.1	3.8	14.0	.0	13.1	2.5	.0	
90% CI	.39	.43	.43	.58	.18	.16	.27	.03	11.6	3.1	11.6	.0	10.8	2.0	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

TABLE B-L-2-2

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 2 SIDELINE - 150 m WEST 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 91.0 kts -- 1.0Vh																
A6	79.10	76.28	66.30	79.88	-.43	-.48	-.12	.02	67.9	197.9	213.7	211.2	228.0	42.7	46.8	S-N
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.8Vh																
A8	78.90	76.37	66.45	78.79	-.31	-.32	.27	-.01	116.4	201.3	224.8	211.2	235.9	38.1	37.6	S-N
A10	78.65	76.25	65.82	78.17	.33	.24	-.81	.09	76.7	212.5	218.3	211.2	217.0	31.4	37.6	N-S
Avg.	78.77	76.31	66.13	78.48	.01	-.04	-.27	.04	96.6	206.9	221.6	211.2	226.4	34.8	37.6	
Std Dv	.18	.08	.45	.44	.45	.40	.76	.07	28.1	7.9	4.6	.0	13.4	4.7	.0	
90% CI	.79	.38	1.99	1.96	2.02	1.77	3.41	.32	125.3	35.4	20.5	.0	59.7	21.2	.0	
150 m FLYOVER -- TARGET IAS 63.7 kts -- 0.7Vh																
A11	80.01	77.07	66.51	79.60	.55	.30	-.32	-.03	102.6	216.8	222.1	211.2	216.4	31.4	32.9	S-N
A12	78.73	75.77	65.95	79.13	.75	.09	-.74	.07	65.5	219.3	241.0	211.2	232.1	28.8	32.9	N-S
Avg.	79.37	76.42	66.23	79.36	.65	.20	-.53	.02	84.1	218.1	231.6	211.2	224.3	30.1	32.9	
Std Dv	.91	.92	.40	.33	.14	.15	.30	.07	26.2	1.8	13.4	.0	11.1	1.8	.0	
90% CI	4.04	4.10	1.77	1.48	.63	.66	1.33	.32	117.1	7.9	59.7	.0	49.6	8.2	.0	
150 m FLYOVER -- TARGET IAS 54.6 kts -- 0.6Vh																
A13	80.90	78.03	69.26	81.66	.92	.70	.23	-.05	133.4	222.3	306.2	211.2	291.0	31.4	28.3	S-N
A14	80.16	77.47	65.95	78.15	1.14	.89	.43	.04	98.1	226.1	228.4	211.2	213.3	33.4	28.3	N-S
Avg.	80.53	77.75	67.60	79.90	1.03	.79	.33	-.01	115.8	224.2	267.3	211.2	252.1	32.4	28.3	
Std Dv	.52	.40	2.34	2.48	.16	.13	.14	.06	25.0	2.7	55.0	.0	54.9	1.4	.0	
90% CI	2.34	1.77	10.45	11.08	.69	.60	.63	.28	111.4	12.0	245.6	.0	245.3	6.3	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation

Volpe Center Acoustics Facility

May 6, 1993

TABLE B-L-3-1

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
APPROACH -- TARGET IAS 52.0 kts																
B15	87.74	86.68	77.46	88.49	-.19	-.22	.31	.00	72.0	184.5	194.0	191.0	200.8	27.8	26.7	N-S
B16	88.48	86.87	76.49	88.28	-.16	-.53	.22	.00	79.0	184.9	188.3	191.0	194.5	27.3	26.7	N-S
B17	88.34	87.58	78.13	88.94	-.07	-.10	.03	.00	70.3	186.3	198.0	191.0	202.9	26.2	26.7	N-S
B18	88.59	87.91	78.68	89.31	-.68	-.67	-.18	.00	87.9	176.1	176.2	191.0	191.1	23.7	26.7	N-S
B19	87.31	85.65	75.53	88.11	-.18	-.77	-.47	.00	72.6	184.0	192.8	191.0	200.1	23.1	26.7	N-S
B20	87.61	86.69	79.12	89.30	-.54	-.54	-.05	.00	85.5	178.3	178.8	191.0	191.5	24.7	26.7	N-S
B21	86.47	85.44	77.12	88.09	-.20	-.45	-.86	.00	123.0	183.6	218.9	191.0	227.7	21.1	26.7	N-S
Avg.	87.79	86.69	77.50	88.65	-.29	-.47	-.14	.00	84.3	182.5	192.4	191.0	201.2	24.8	26.7	
Std Dv	.76	.91	1.26	.53	.23	.24	.41	.00	18.4	3.8	14.1	.0	12.6	2.4	.0	
90% CI	.55	.67	.92	.39	.17	.17	.30	.00	13.5	2.8	10.4	.0	9.2	1.8	.0	
TAKEOFF -- TARGET IAS 52.0 kts																
C22	82.76	79.87	70.76	83.97	-.05	-.08	-.52	.00	89.2	159.7	159.7	163.8	163.8	23.1	26.7	N-S
C23	83.08	79.67	69.77	83.67	-.08	-.36	-.32	.00	80.9	159.2	161.2	163.8	165.9	24.2	26.7	N-S
C24	83.29	80.19	70.40	83.79	-.08	-.12	-.61	.00	86.1	159.2	159.6	163.8	164.2	22.6	26.7	N-S
C25	82.92	80.10	71.12	84.12	-.01	-.05	-.43	.00	83.1	160.2	161.4	163.8	165.0	23.7	26.7	N-S
C26	83.32	80.38	71.16	83.99	-.02	-.10	-.23	.00	106.9	159.2	166.4	163.8	171.2	24.7	26.7	N-S
C27	82.06	78.90	68.53	82.06	.10	-.12	-.98	.00	62.3	161.9	182.9	163.8	185.0	21.1	26.7	N-S
Avg.	82.90	79.85	70.29	83.60	-.02	-.14	-.51	.00	84.8	159.9	165.2	163.8	169.2	23.2	26.7	
Std Dv	.47	.53	1.00	.77	.07	.11	.27	.00	14.4	1.1	9.0	.0	8.2	1.3	.0	
90% CI	.38	.43	.83	.63	.06	.09	.22	.00	11.8	.9	7.4	.0	6.7	1.1	.0	
150 m FLYOVER -- TARGET IAS 81.9 kts -- 0.9Vh																
A1	79.08	76.03	66.31	79.54	-.09	-.12	-.33	.01	110.2	205.5	219.0	211.2	225.1	38.1	42.2	N-S
A2	79.53	77.25	66.60	79.06	-.29	-.32	.27	.08	60.7	200.6	229.9	211.2	242.1	42.7	42.2	S-N
A3	79.25	76.10	66.75	79.98	-.10	-.25	-.32	.01	94.7	205.1	205.8	211.2	211.9	38.1	42.2	N-S
A4	79.86	76.74	66.09	79.34	-.66	-1.27	.42	.08	57.1	194.1	231.1	211.2	251.5	42.7	42.2	S-N
A5	78.81	75.75	66.51	79.88	.22	.17	-.56	.01	106.3	211.0	219.8	211.2	220.0	37.0	42.2	N-S
A9	79.40	76.98	67.48	79.10	-.13	-.17	-.18	.08	77.1	203.9	209.2	211.2	216.7	39.1	42.2	S-N
Avg.	79.23	76.47	66.62	79.48	-.17	-.33	-.12	.04	84.3	203.4	219.1	211.2	227.9	39.6	42.2	
Std Dv	.36	.60	.48	.39	.29	.49	.38	.04	22.9	5.7	10.4	.0	15.6	2.5	.0	
90% CI	.30	.49	.39	.32	.24	.40	.31	.03	18.8	4.6	8.5	.0	12.8	2.0	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

U.S. Department of Transportation
Volpe Center Acoustics Facility

May 6, 1993

TABLE B-L-3-2

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SUMMARY NOISE LEVEL DATA
CORRECTED*

MICROPHONE NO. 3 SIDELINE - 150 m EAST 07/22/91

	CORRECTED (dB)				CORRECTIONS (dB)				ACOUSTIC ANGLE	TRACKING DATA (Meters) (ACTUAL)		(REFERENCE)		SPEED(m/sec)		DIR
EV	EPNL	SEL	ALm	PNLTm	/\1(P)	/\1(A)	/\2	/\3	(Deg)	CPA	SR	CPAR	SRR	GRND	REF	
150 m FLYOVER -- TARGET IAS 91.0 kts -- 1.0Vh																
A6	78.91	76.33	67.45	79.30	-.75	-.97	-.01	.10	98.5	193.3	195.4	211.2	213.6	42.7	46.8	S-N
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.8Vh																
A8	78.85	76.49	66.90	78.55	-.86	-.82	.48	.09	92.7	191.5	191.7	211.2	211.4	38.1	37.6	S-N
A10	78.92	75.95	68.37	81.21	.14	.08	-.75	-.01	72.5	209.9	220.1	211.2	221.4	31.4	37.6	N-S
Avg.	78.88	76.22	67.64	79.88	-.36	-.37	-.14	.04	82.6	200.7	205.9	211.2	216.4	34.8	37.6	
Std Dv	.05	.38	1.04	1.88	.71	.64	.87	.07	14.3	13.0	20.1	.0	7.1	4.7	.0	
90% CI	.22	1.07	4.64	8.40	3.16	2.84	3.88	.32	63.8	58.1	89.7	.0	31.6	21.2	.0	
150 m FLYOVER -- TARGET IAS 63.7 kts -- 0.7Vh																
A11	79.34	76.26	66.22	79.38	-.04	-.59	-.03	.07	107.9	202.9	213.2	211.2	221.9	31.4	32.9	S-N
A12	-	76.09	68.83	81.67	.61	.53	-.74	-.03	105.3	219.3	227.4	211.2	219.0	28.8	32.9	N-S
Avg.	79.34	76.18	67.53	80.52	.28	-.03	-.38	.02	106.6	211.1	220.3	211.2	220.4	30.1	32.9	
Std Dv	.00	.12	1.85	1.62	.46	.79	.50	.07	1.8	11.6	10.0	.0	2.1	1.8	.0	
90% CI	.00	.54	8.24	7.23	2.05	3.54	2.24	.32	8.2	51.8	44.8	.0	9.2	8.2	.0	
150 m FLYOVER -- TARGET IAS 54.6 kts -- 0.6Vh																
A13	80.69	78.02	67.94	79.71	.52	.38	.38	.04	85.6	214.9	215.5	211.2	211.8	31.4	28.3	S-N
A14	80.41	77.54	66.19	79.60	.40	.31	.66	-.05	98.7	214.5	217.0	211.2	213.7	33.4	28.3	N-S
Avg.	80.55	77.78	67.07	79.65	.46	.34	.52	-.01	92.1	214.7	216.3	211.2	212.8	32.4	28.3	
Std Dv	.20	.34	1.24	.08	.08	.05	.20	.06	9.3	.3	1.1	.0	1.3	1.4	.0	
90% CI	.88	1.52	5.52	.35	.38	.22	.88	.28	41.4	1.3	4.7	.0	6.0	6.3	.0	

* - NOISE DATA ADJUSTED TO REFERENCE CONDITIONS USING THE "SIMPLIFIED" PROCEDURE

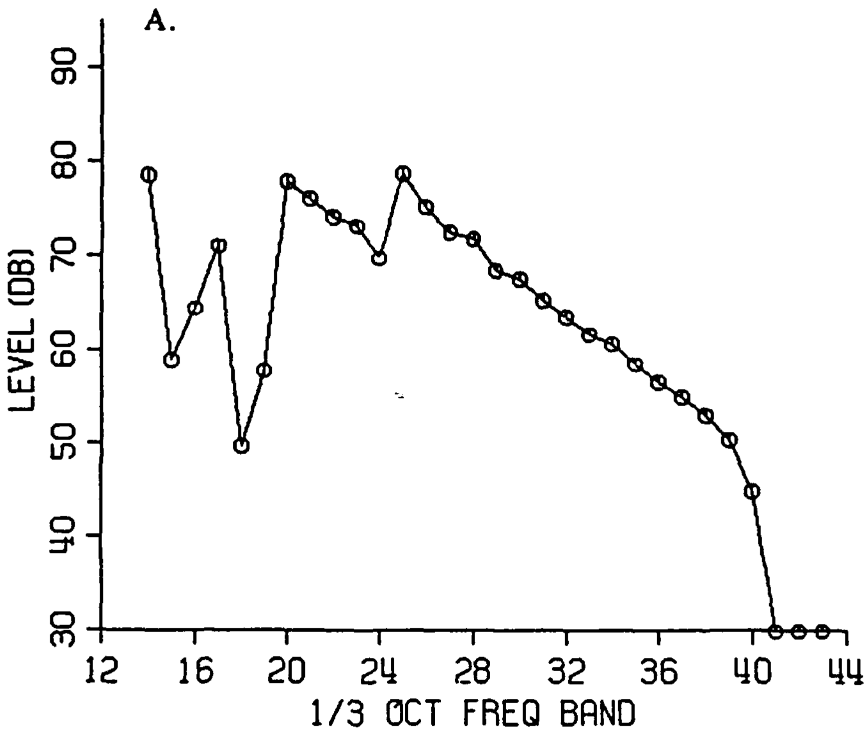
Note: Data may have been obtained under wind conditions exceeding the restrictions of FAR Part 36 H36.101c4, see Appendix F.

APPENDIX C

AS-MEASURED 1/3-OCTAVE SPECTRAL DATA

This Appendix presents as-measured 1/3-octave spectral data for representative measurement runs, Figures C-A-1-1* through C-L-3-3. Each figure presents: (1) the 1/3-octave spectrum at the time of $PNLT_{MAX}$; and (2) the 1/3-octave spectral time history defined by the leading and trailing 10 dB down points.

*In the numerical notation for Figure number, the first letter denotes Appendix, the second letter denotes helicopter configuration (as discussed in Section 1.4), and the first number denotes site, i.e., site 1 - centerline, site 2 - sideline/east, or site 3 - sideline/west, and the second number differentiates between standard Far Part 36 tests (denoted by a 1) and additional flyover tests (denoted by a 2). For example, Figure C-A-1-1 displays noise data measured for helicopter Configuration A (Schweizer, Standard Configuration), subject to standard FAR Part 36 requirements.



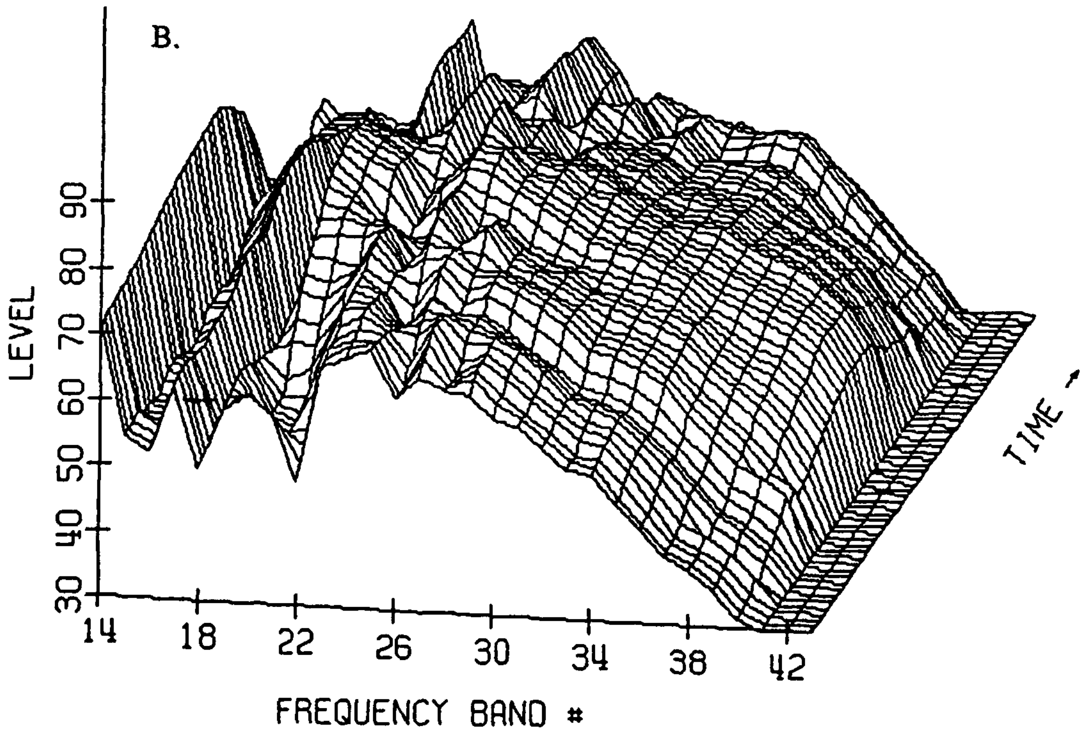
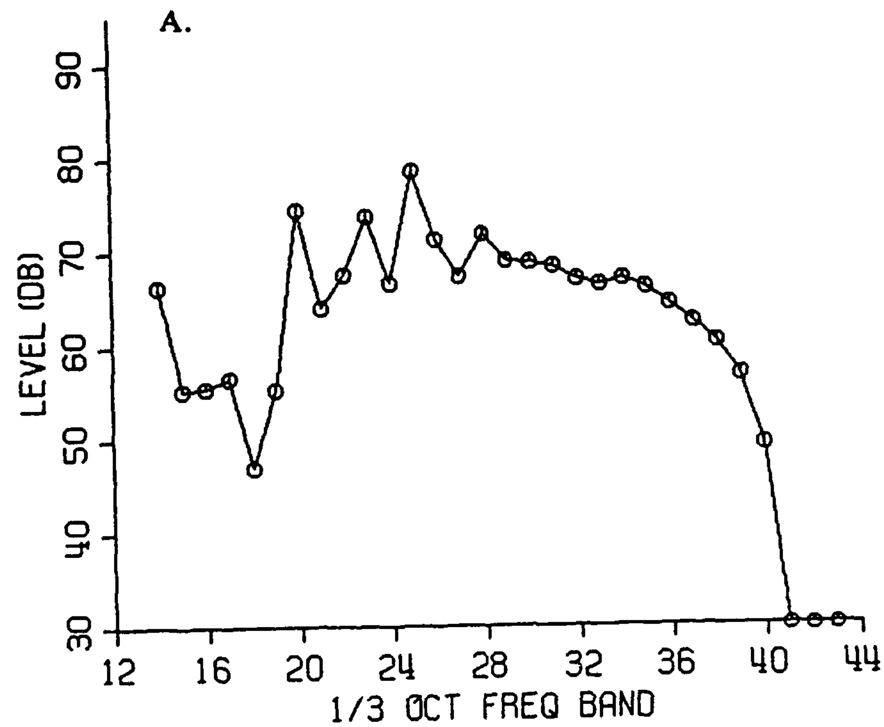


FIGURE C-A-1-1: EVENT B3 - APPROACH - 07/22/91
SCHWEIZER 300 - CONFIGURATION A
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



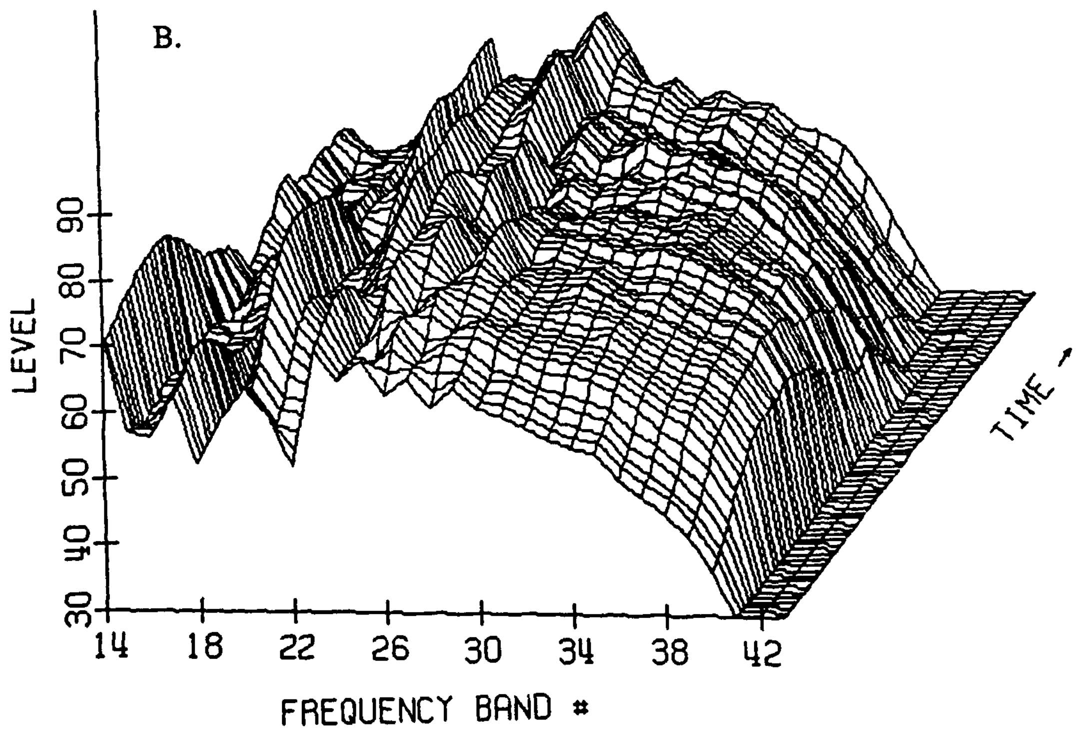
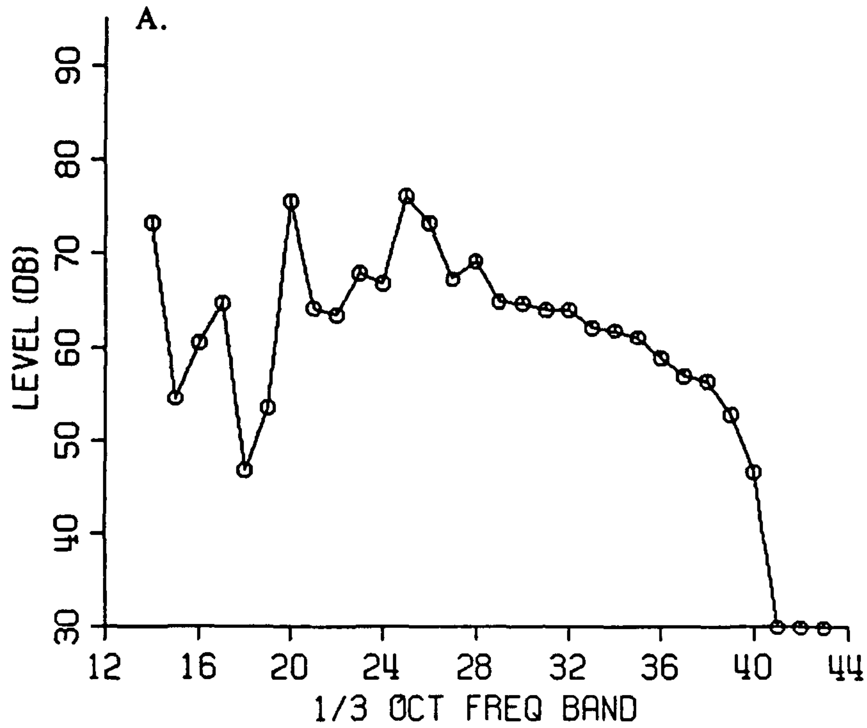


FIGURE C-A-1-2: EVENT C8 - TAKEOFF - 07/22/91
SCHWEIZER 300 - CONFIGURATION A
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



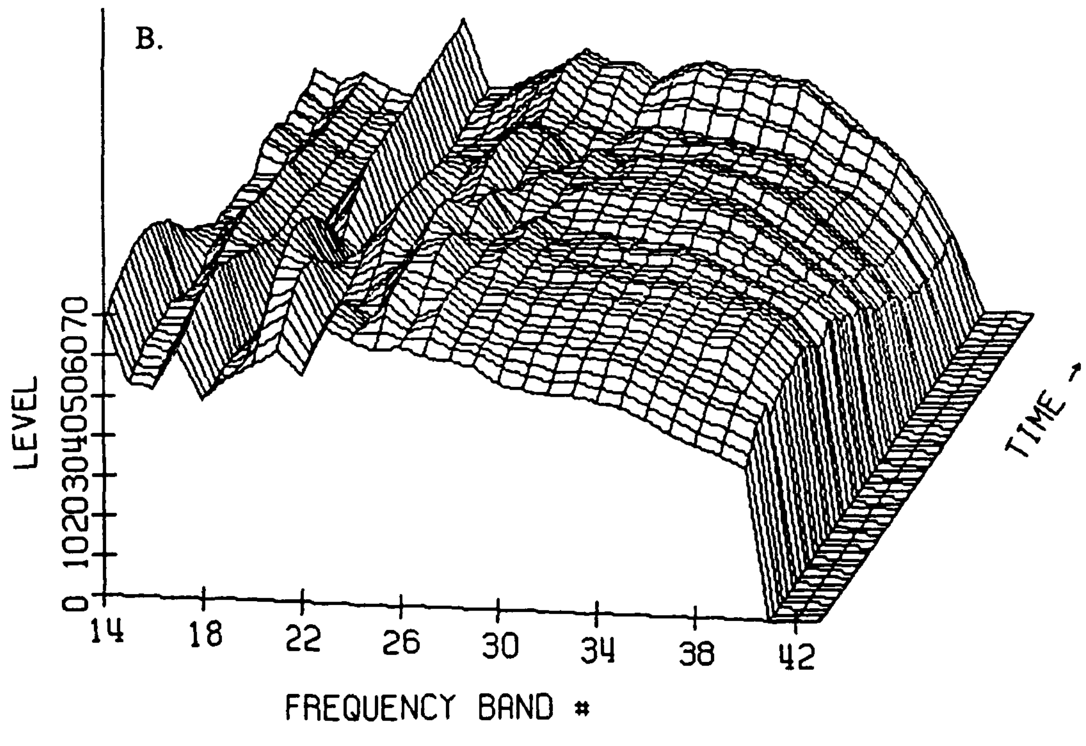
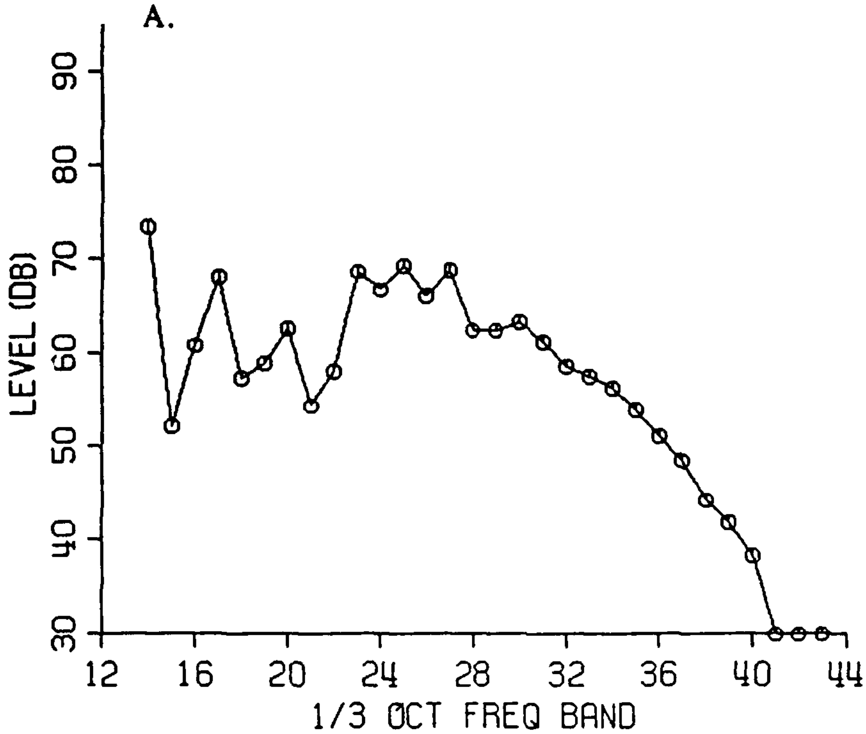


FIGURE C-A-1-3: EVENT A1 - LEVEL FLYOVER - 07/22/91
SCHWEIZER 300 - CONFIGURATION A
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



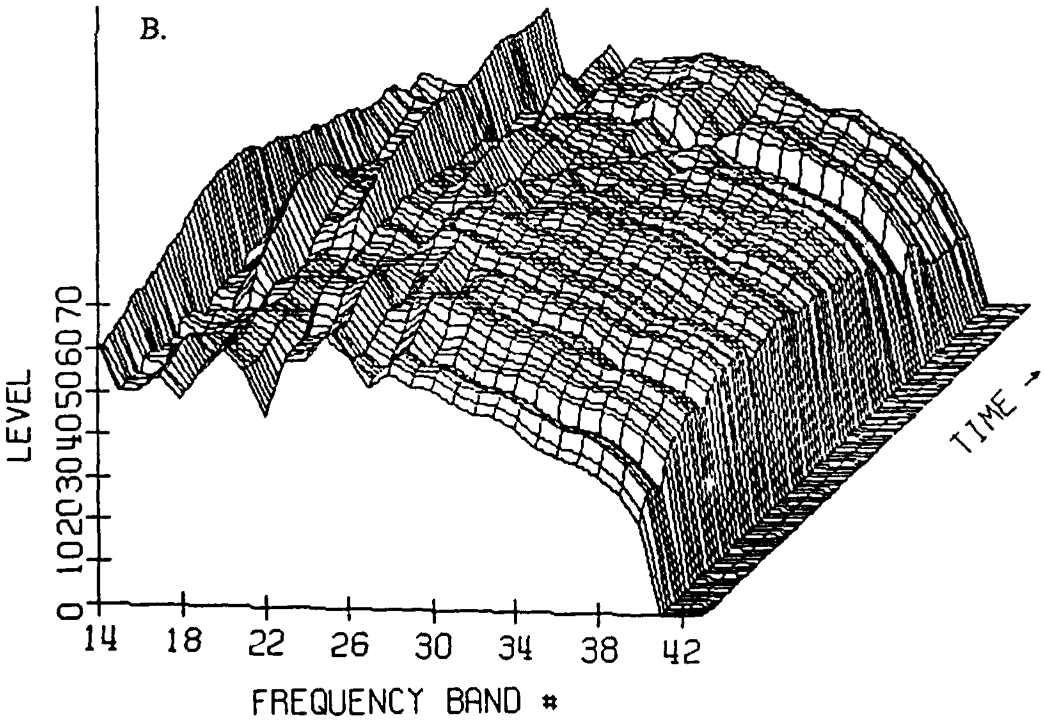
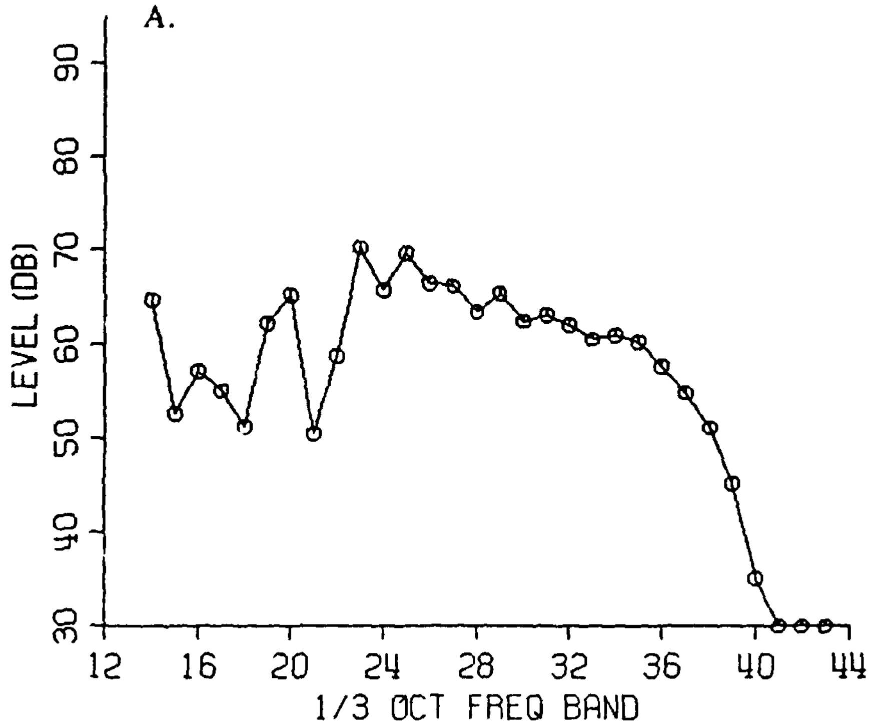


FIGURE C-A-2-1: EVENT B3 - APPROACH - 07/22/91
SCHWEIZER 300 - CONFIGURATION A
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



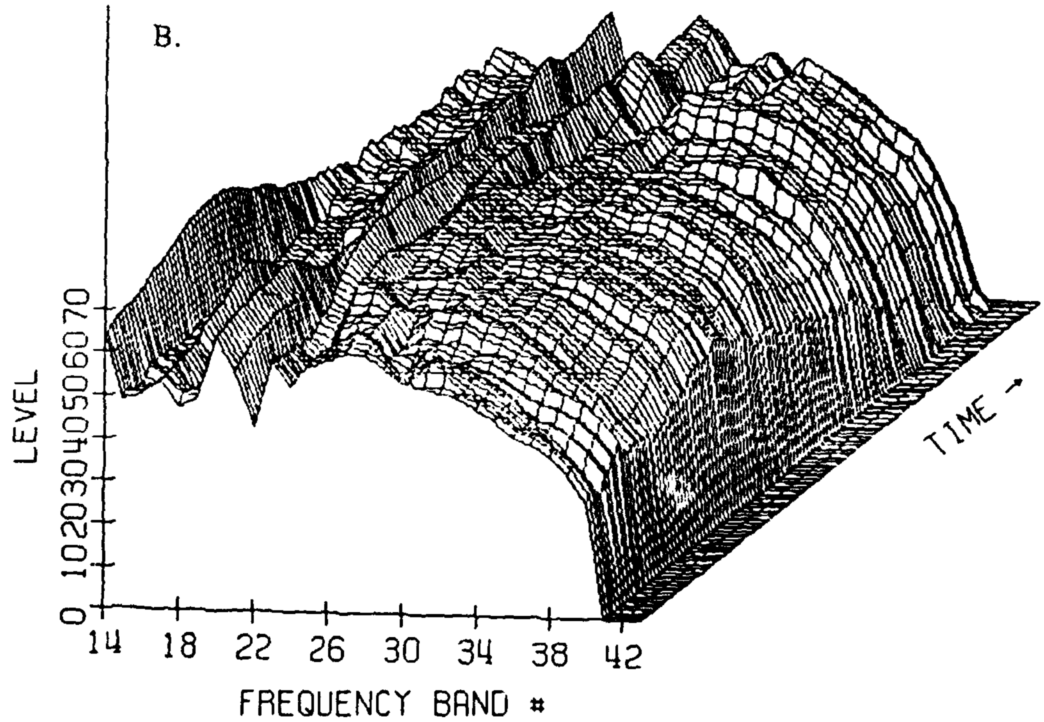
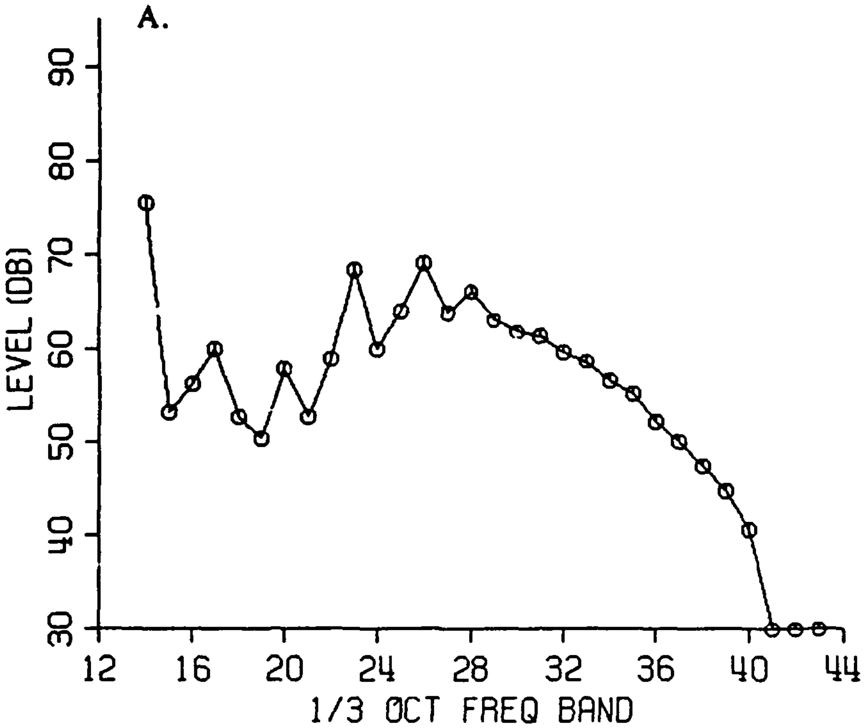


FIGURE C-A-2-2: EVENT C8 - TAKEOFF - 07/22/91
SCHWEIZER 300 - CONFIGURATION A
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

A.



B.

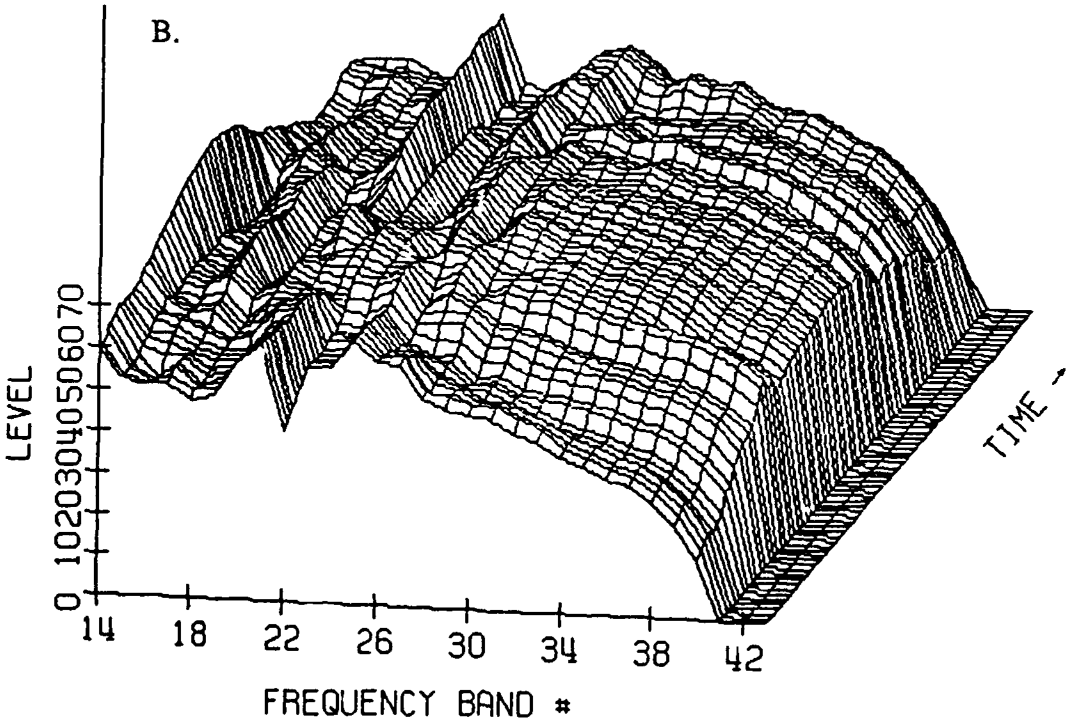
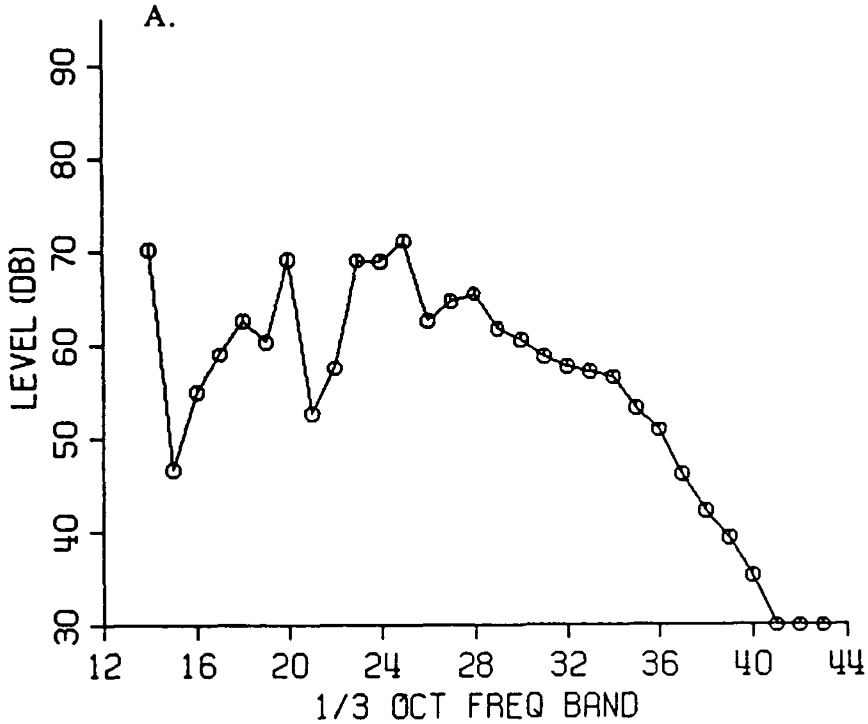


FIGURE C-A-2-3: EVENT A1 - LEVEL FLYOVER - 07/22/91
SCHWEIZER 300 - CONFIGURATION A
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



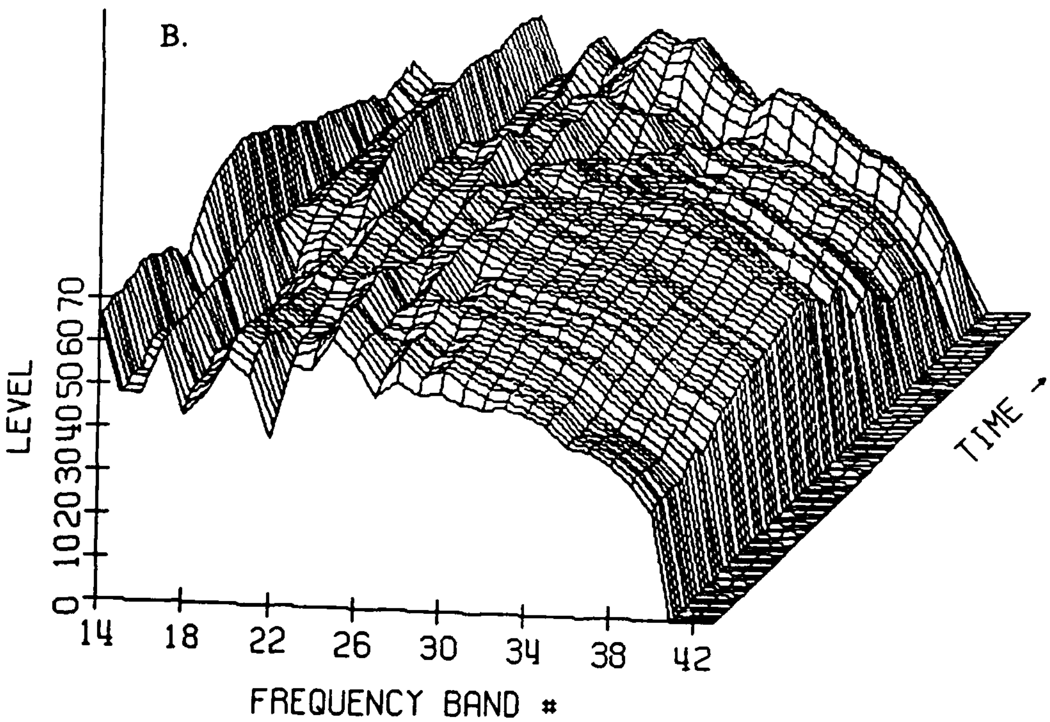
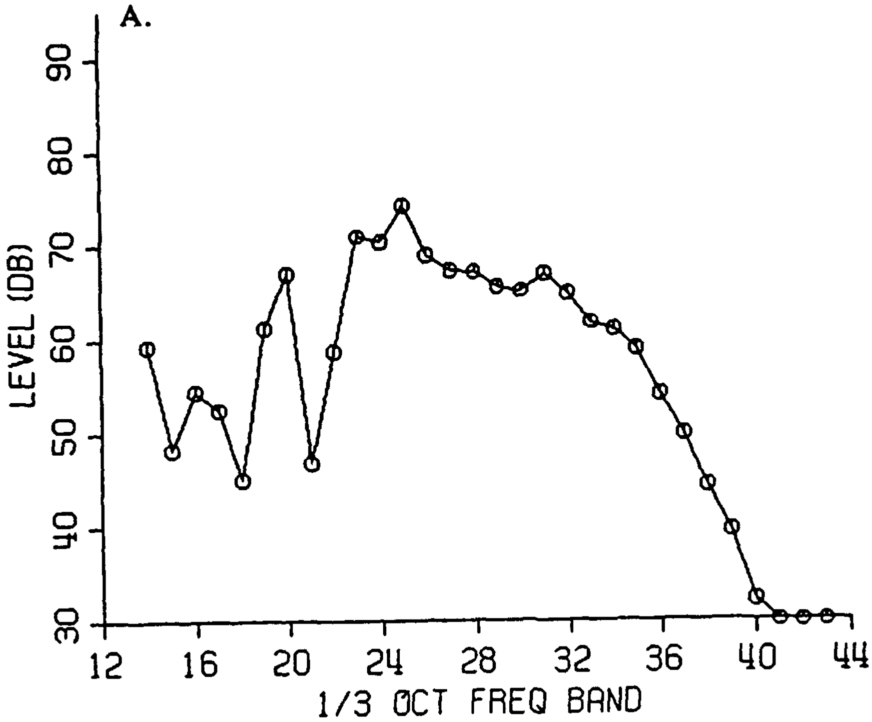


FIGURE C-A-3-1: EVENT B3 - APPROACH - 07/22/91
SCHWEIZER 300 - CONFIGURATION A
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



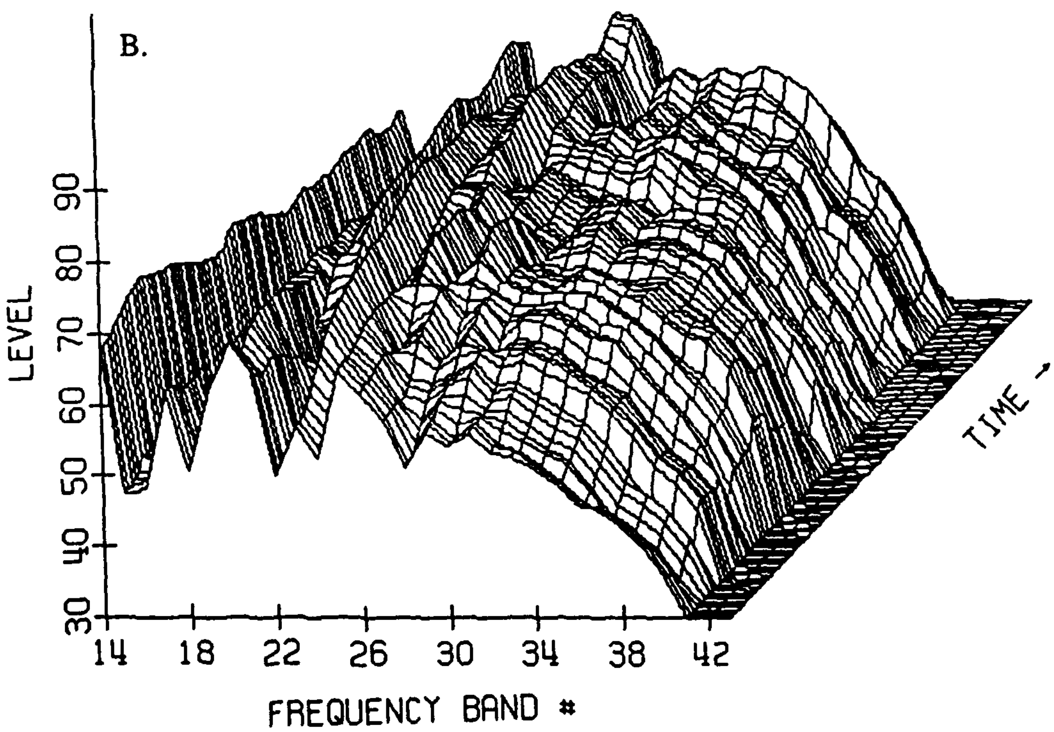
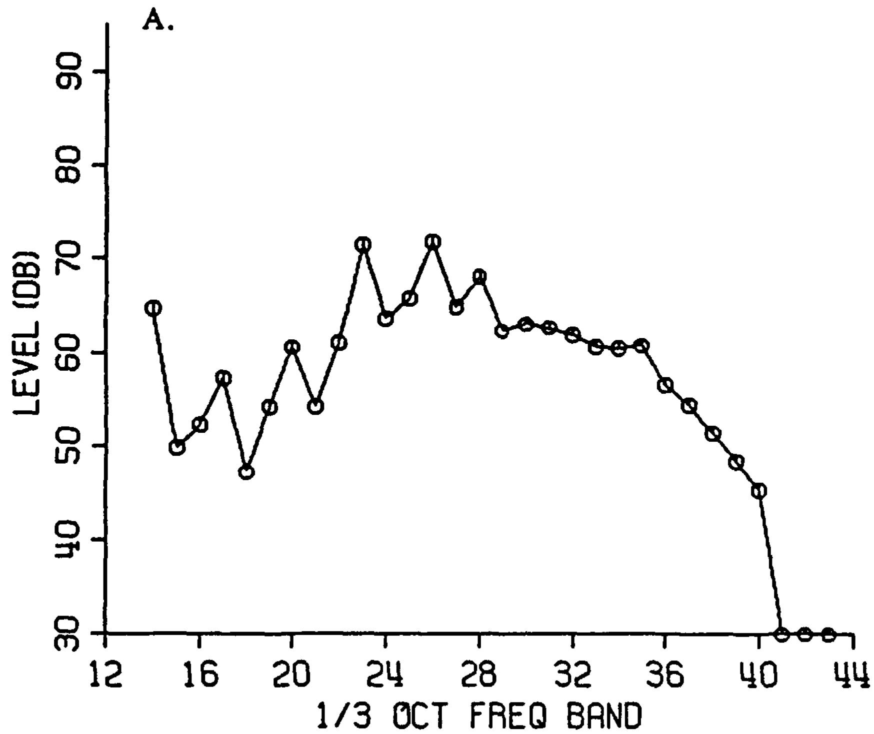


FIGURE C-A-3-2: EVENT C8 - TAKEOFF - 07/22/91
SCHWEIZER 300 - CONFIGURATION A
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



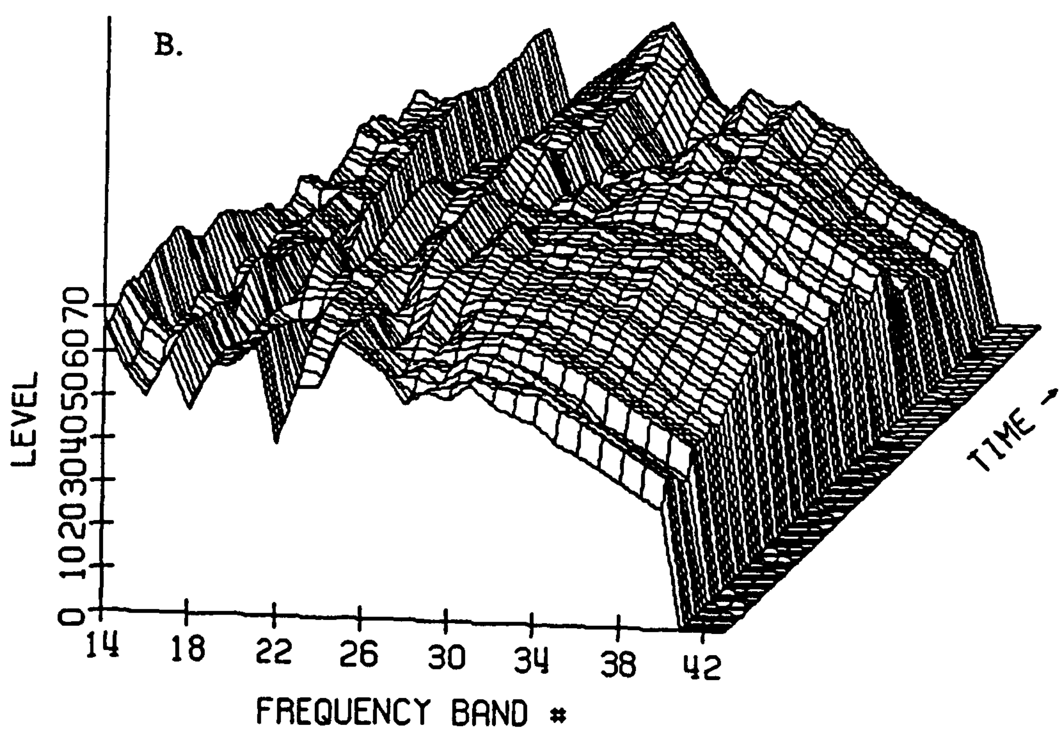
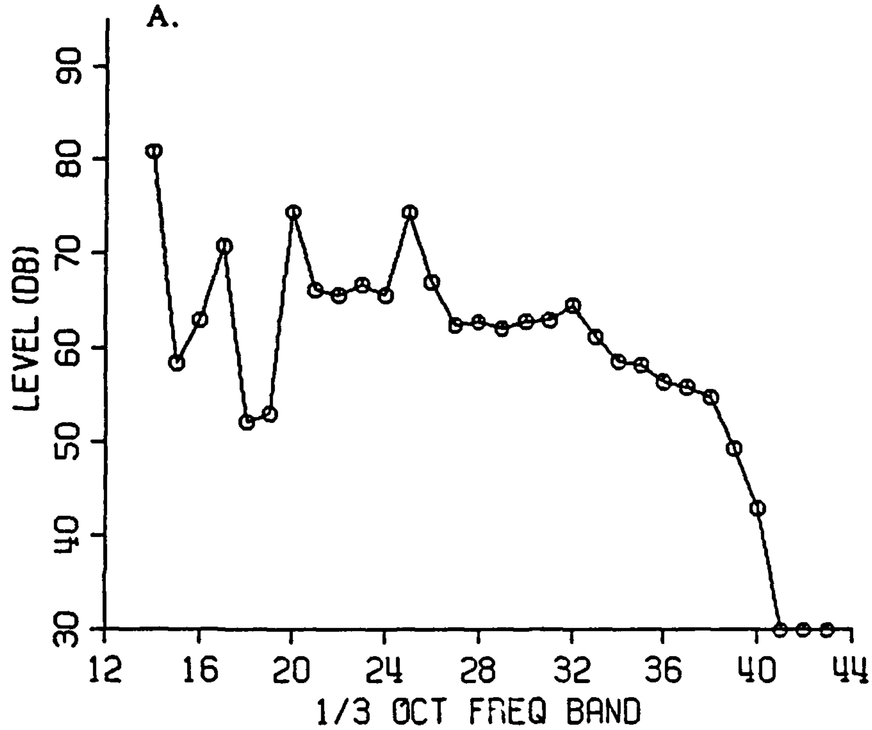


FIGURE C-A-3-3: EVENT A1 - LEVEL FLYOVER - 07/22/91
SCHWEIZER 300 - CONFIGURATION A
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



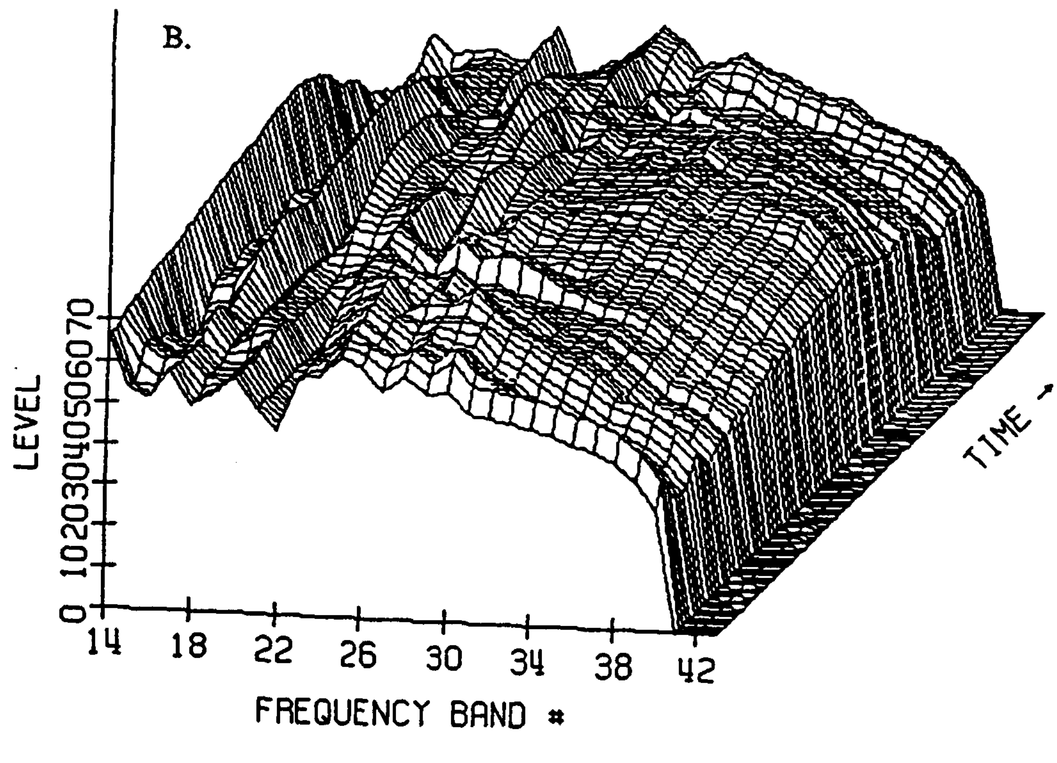


FIGURE C-B-1-1: EVENT B18 - APPROACH - 07/22/91
SCHWEIZER 300 - CONFIGURATION B
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

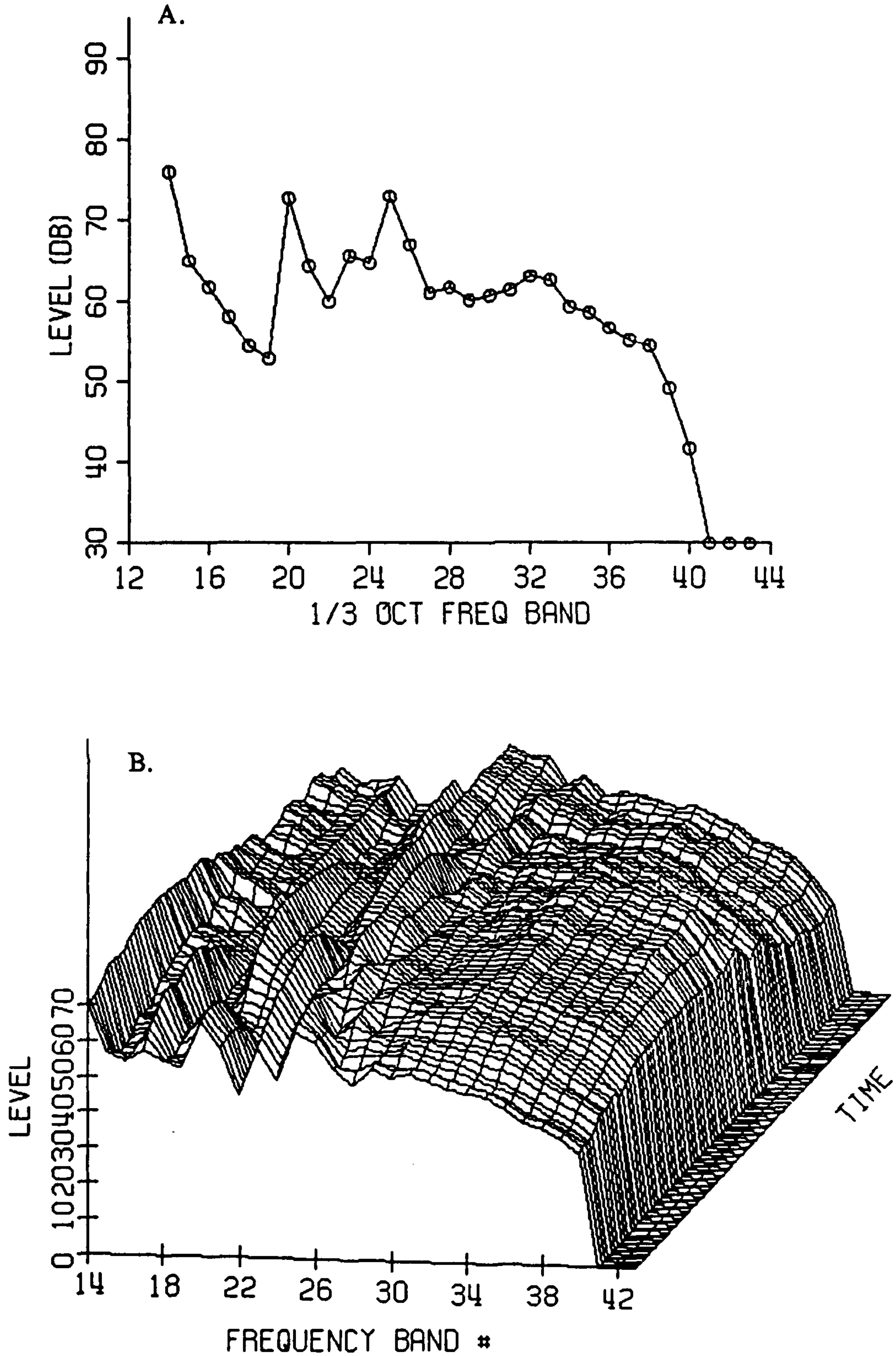


FIGURE C-B-1-2: EVENT C27 - TAKEOFF - 07/22/91
SCHWEIZER 300 - CONFIGURATION B
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

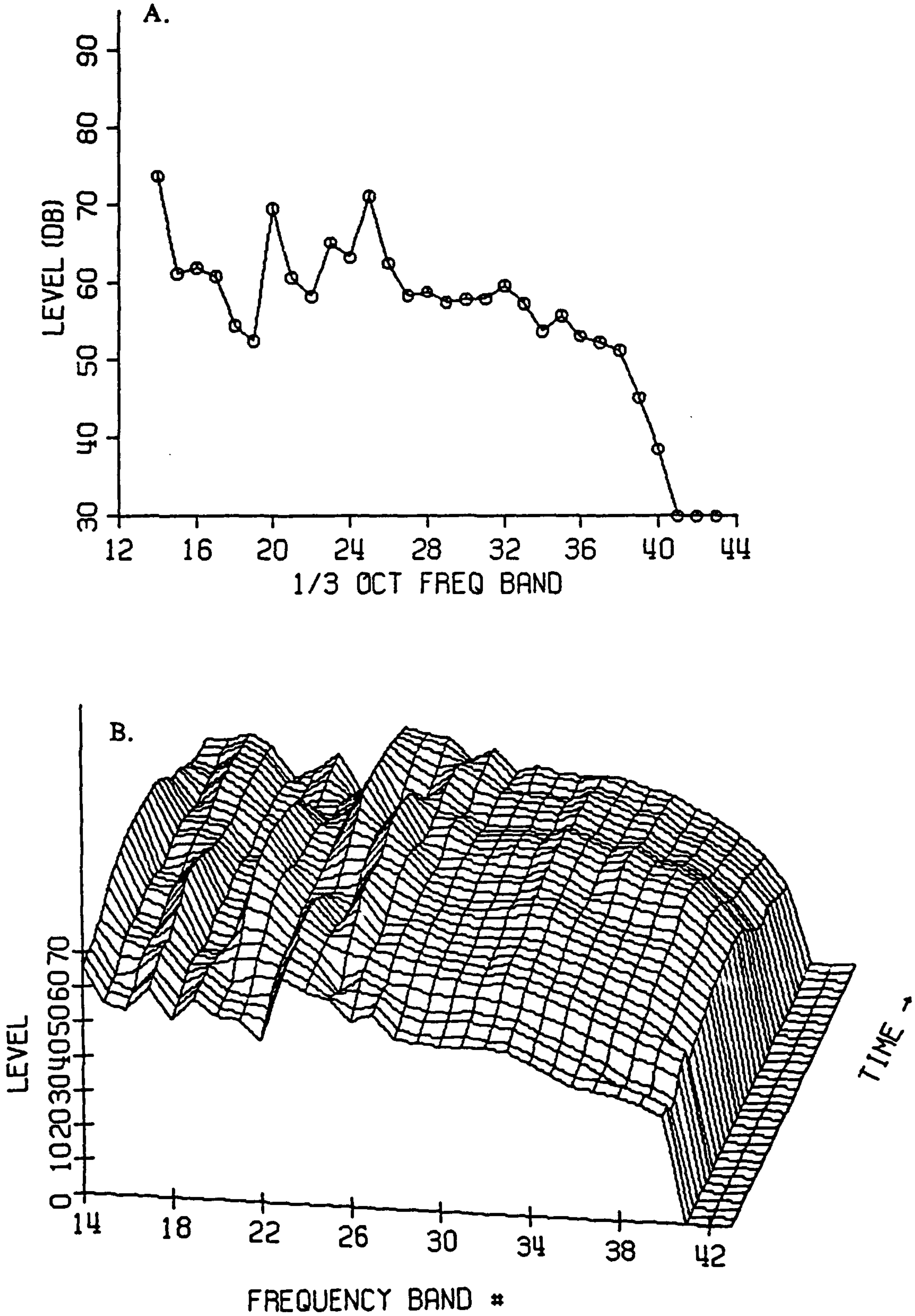
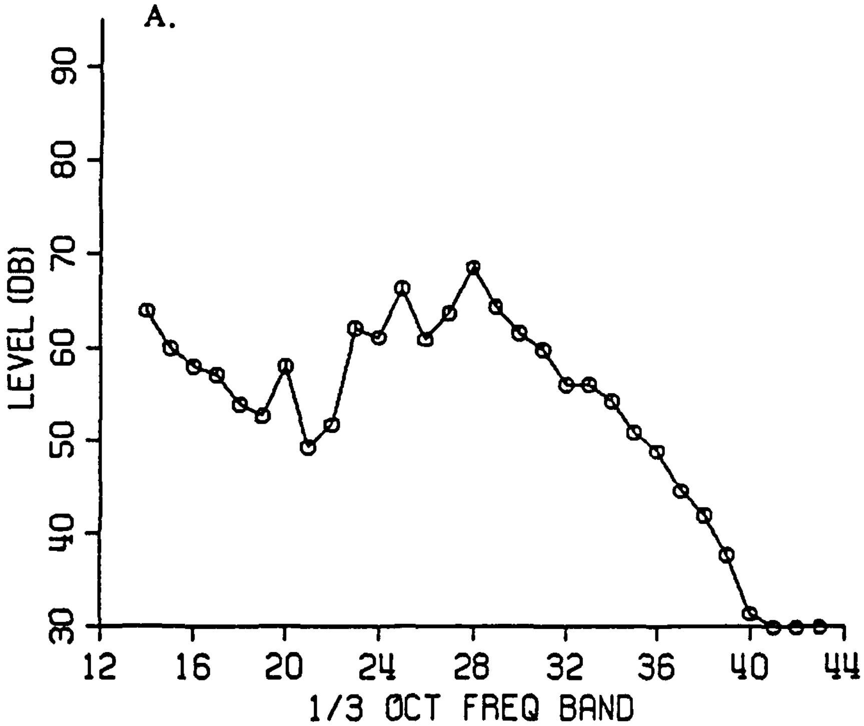


FIGURE C-B-1-3: EVENT A5 - LEVEL FLYOVER - 07/22/91
SCHWEIZER 300 - CONFIGURATION B
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



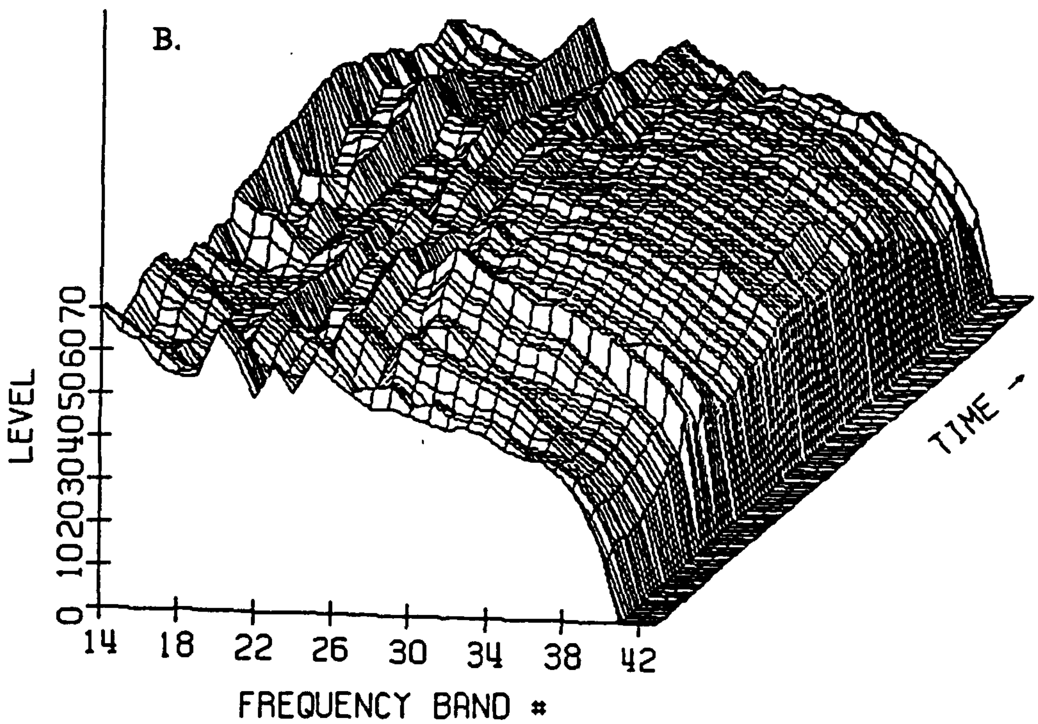
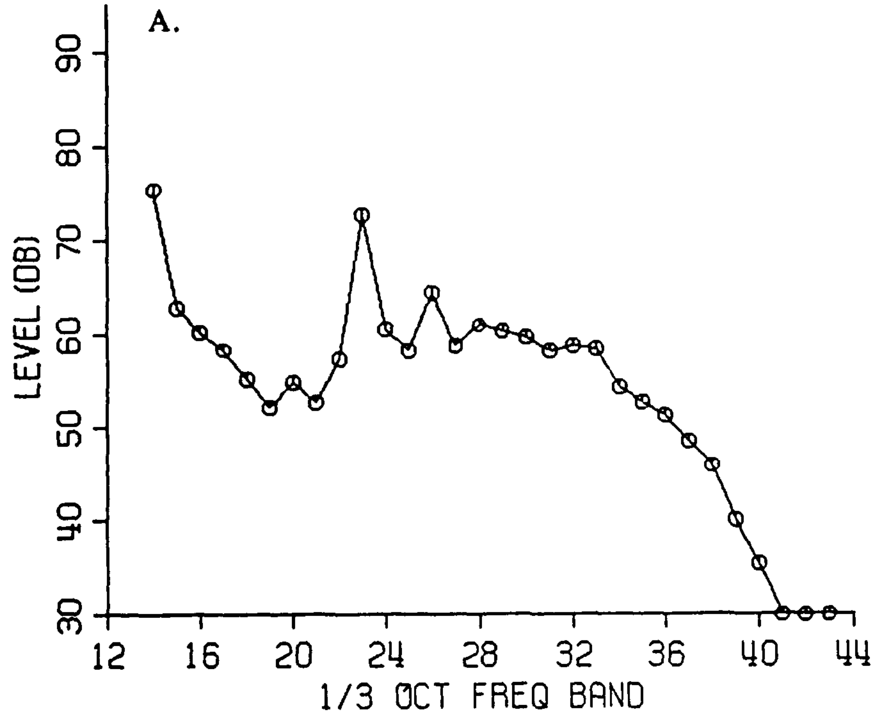


FIGURE C-B-2-1: EVENT B18 - APPROACH - 07/22/91
SCHWEIZER 300 - CONFIGURATION B
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



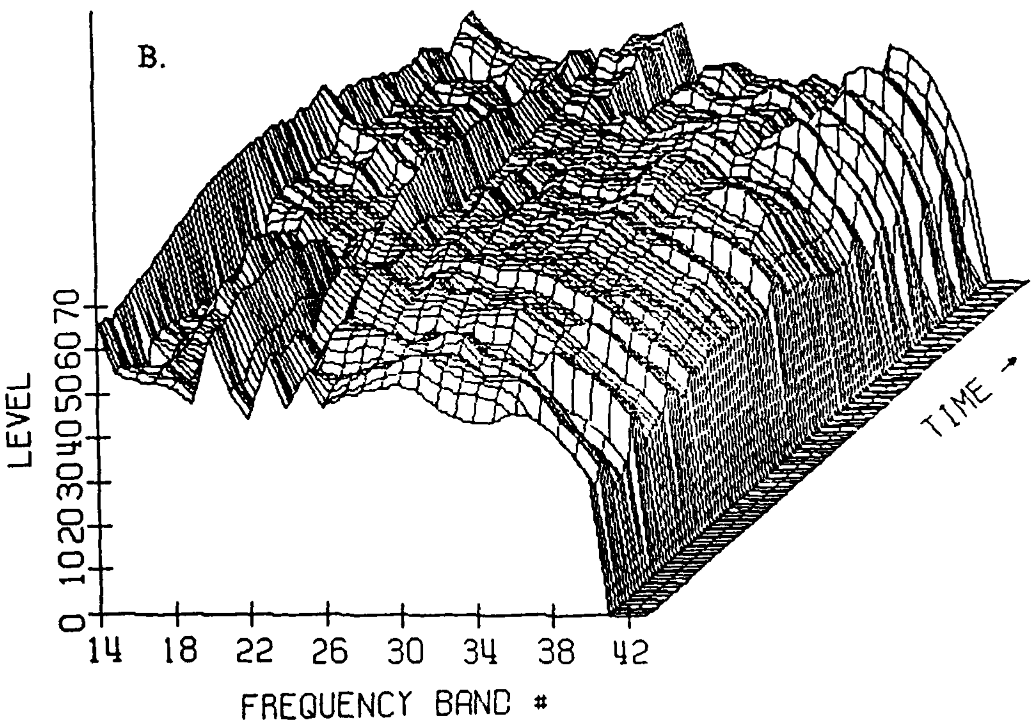
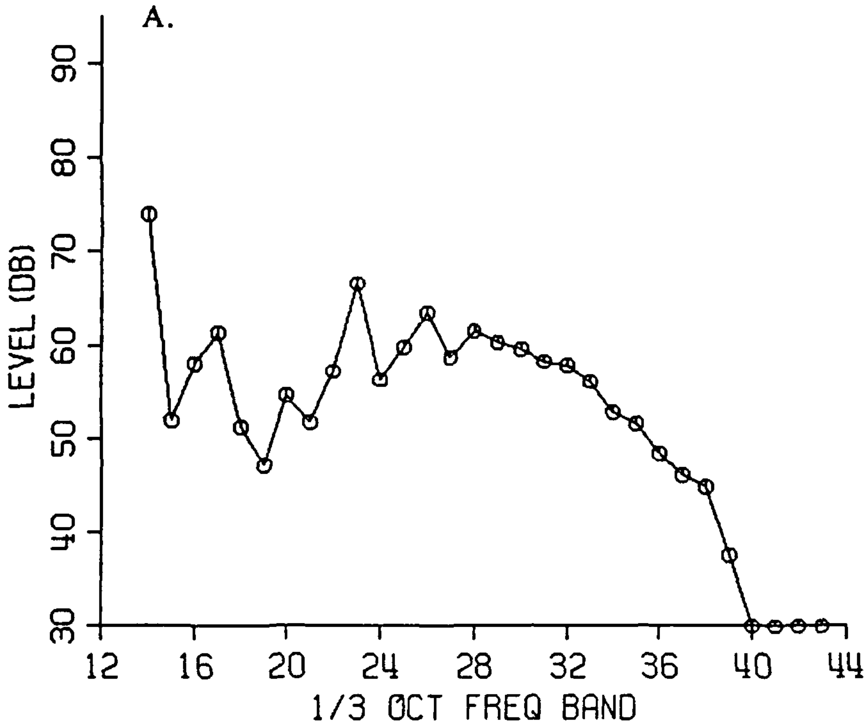


FIGURE C-B-2-2: EVENT C27 - TAKEOFF - 07/22/91
SCHWEIZER 300 - CONFIGURATION B
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



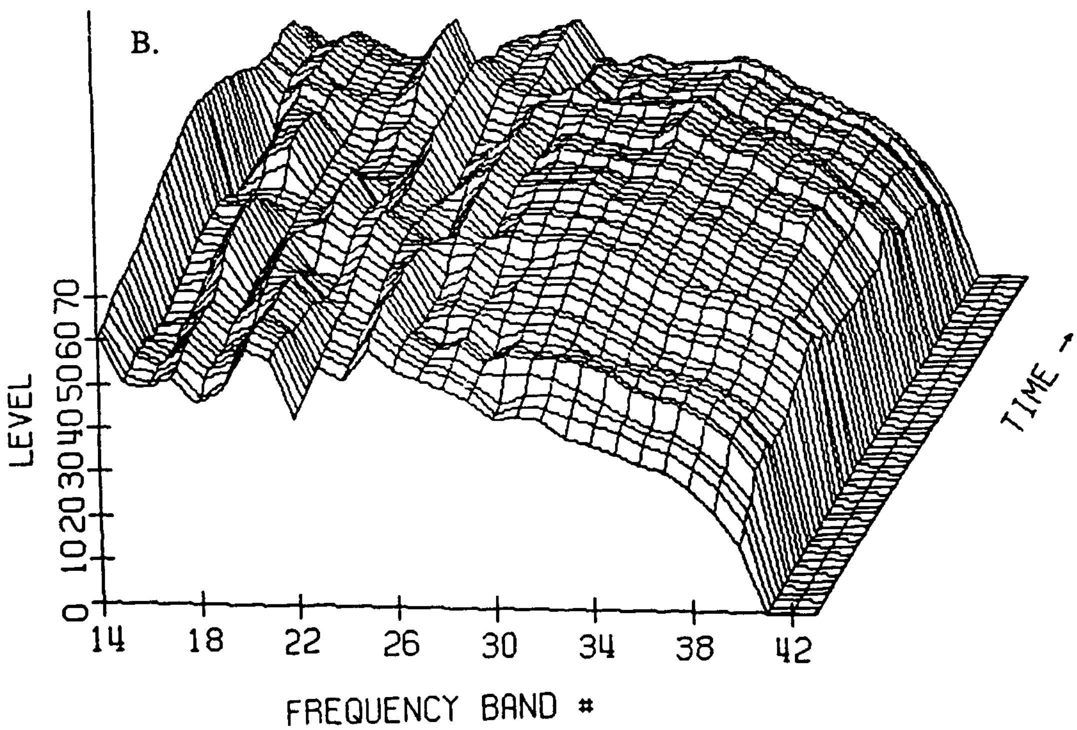
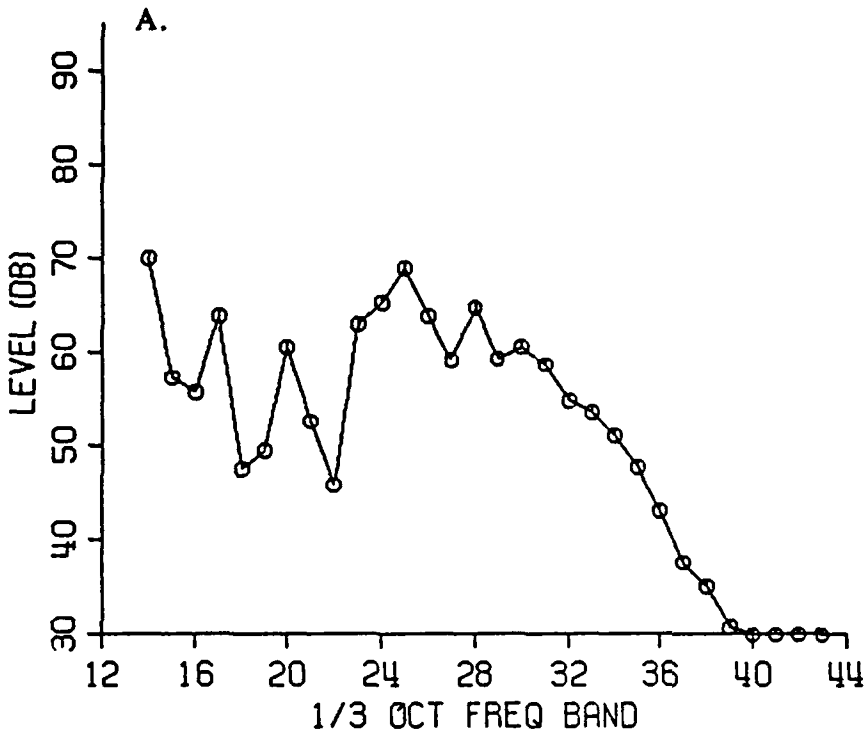


FIGURE C-B-2-3: EVENT A5 - LEVEL FLYOVER - 07/22/91
SCHWEIZER 300 - CONFIGURATION B
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



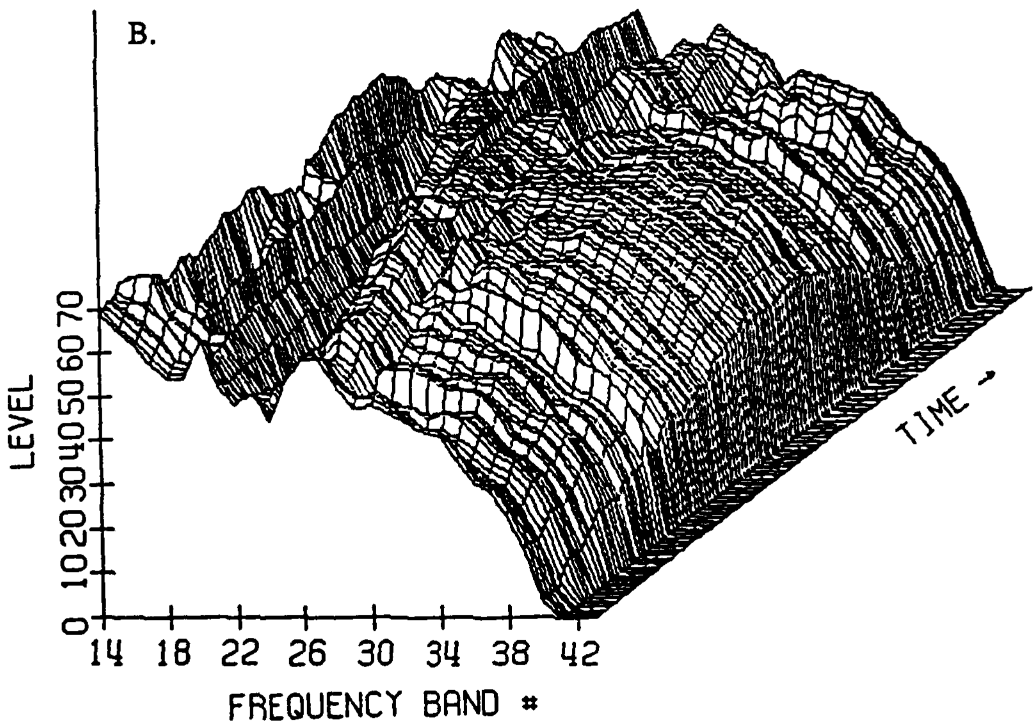
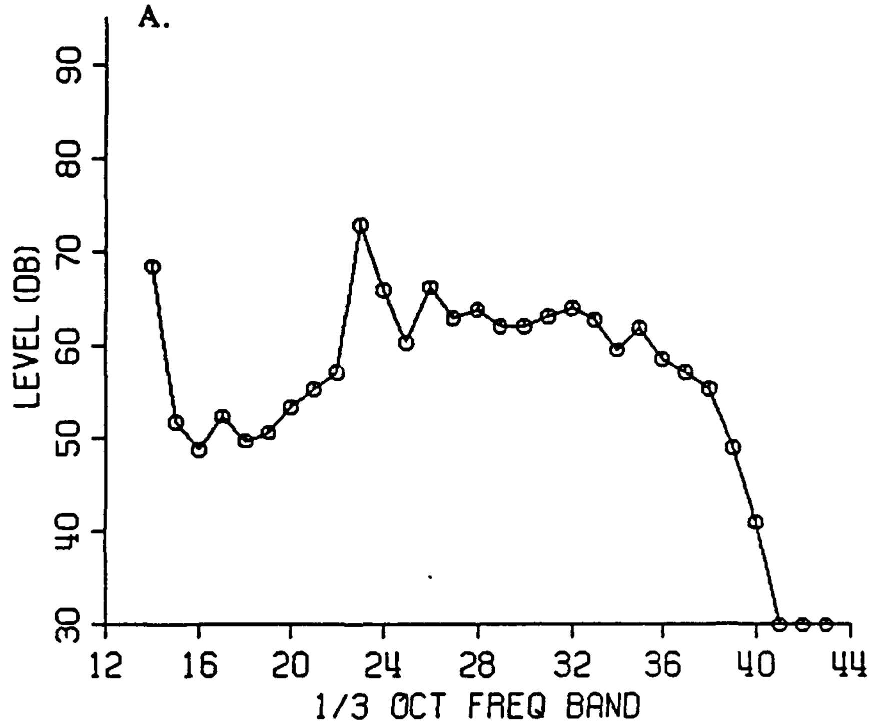


FIGURE C-B-3-1: EVENT B18 - APPROACH - 07/22/91
SCHWEIZER 300 - CONFIGURATION B
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



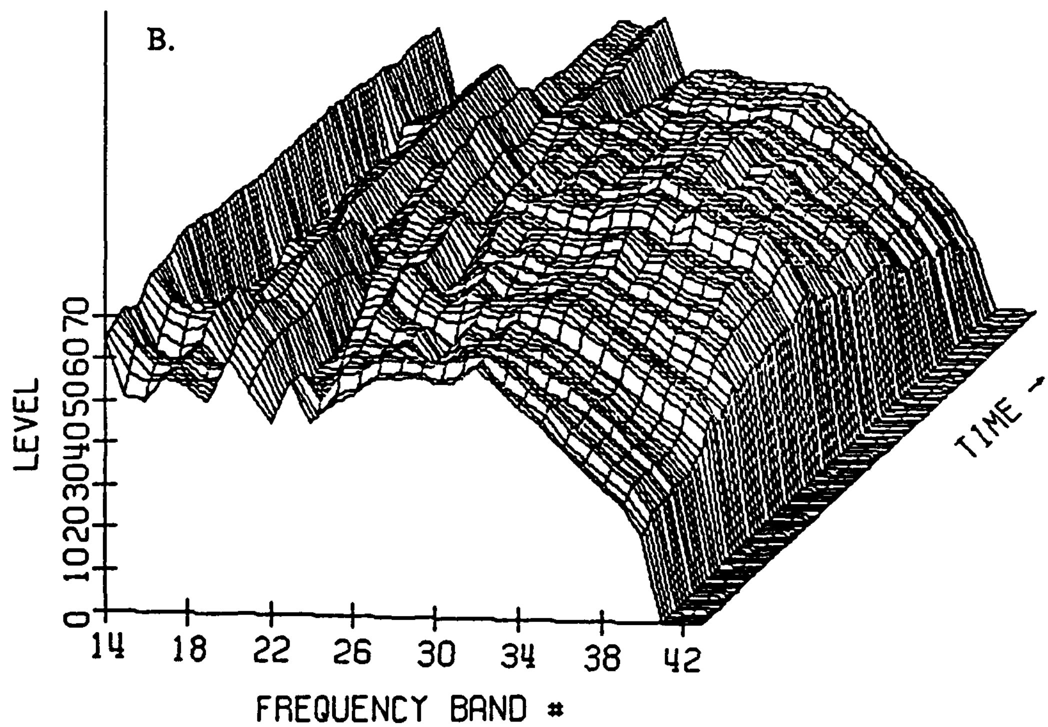
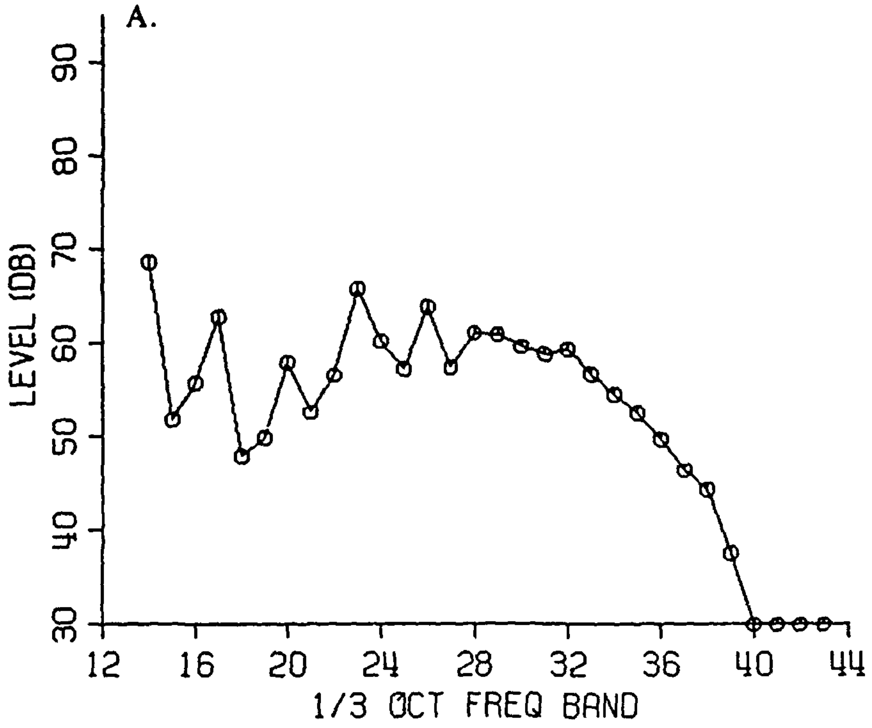


FIGURE C-B-3-2: EVENT C27 - TAKEOFF - 07/22/91
SCHWEIZER 300 - CONFIGURATION B
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



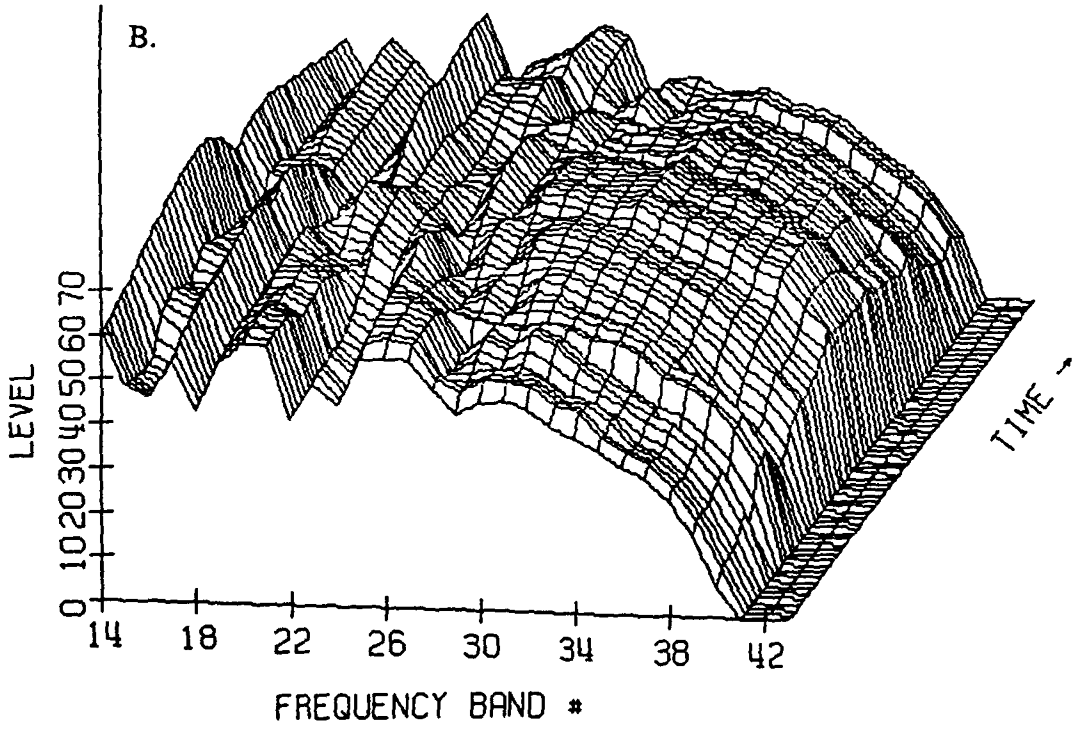
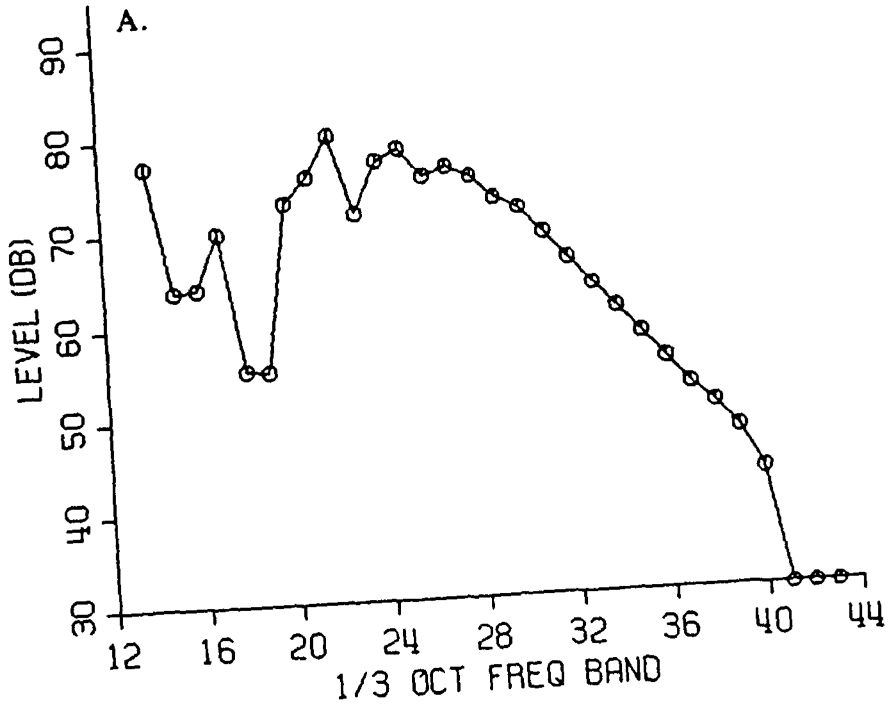


FIGURE C-B-3-3: EVENT A5 - LEVEL FLYOVER - 07/22/91
SCHWEIZER 300 - CONFIGURATION B
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



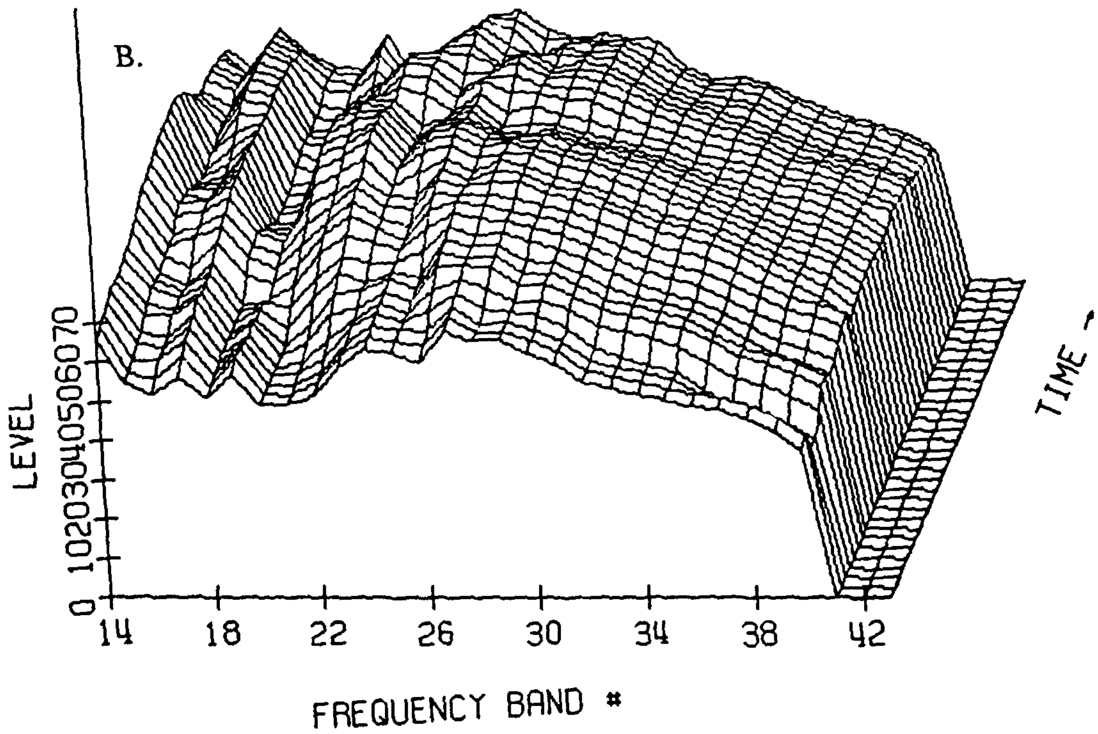
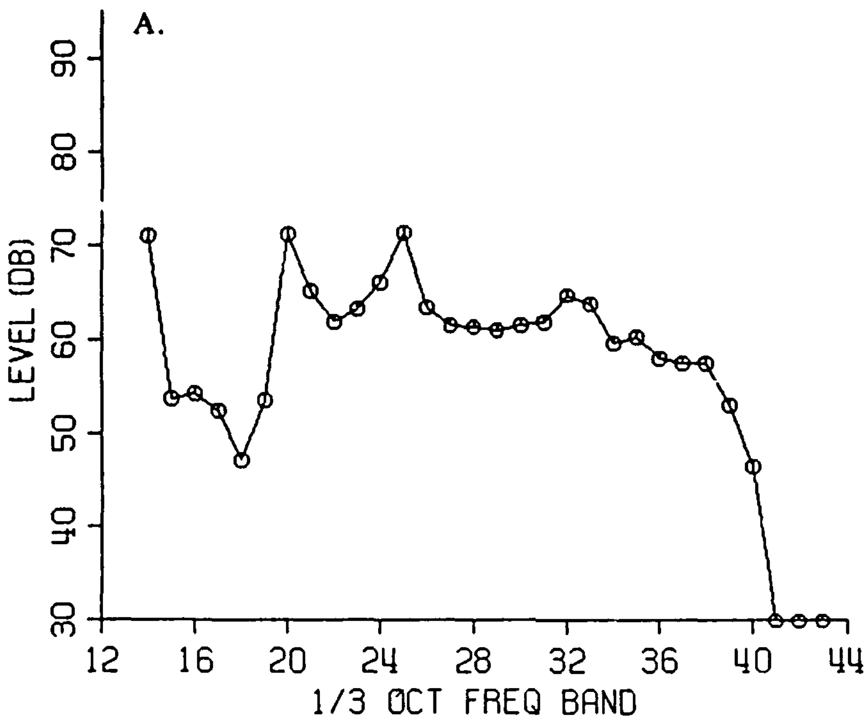


FIGURE C-C-1-1: EVENT B24 - APPROACH - 07/23/91
SCHWEIZER 300 - CONFIGURATION C
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



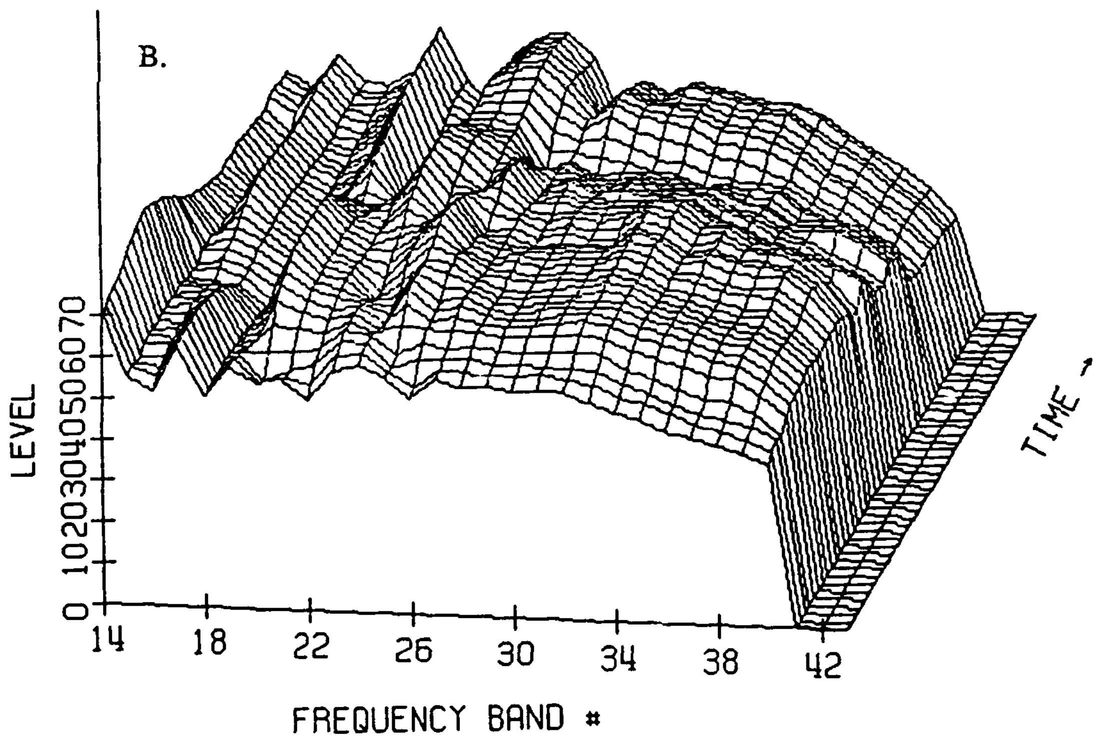
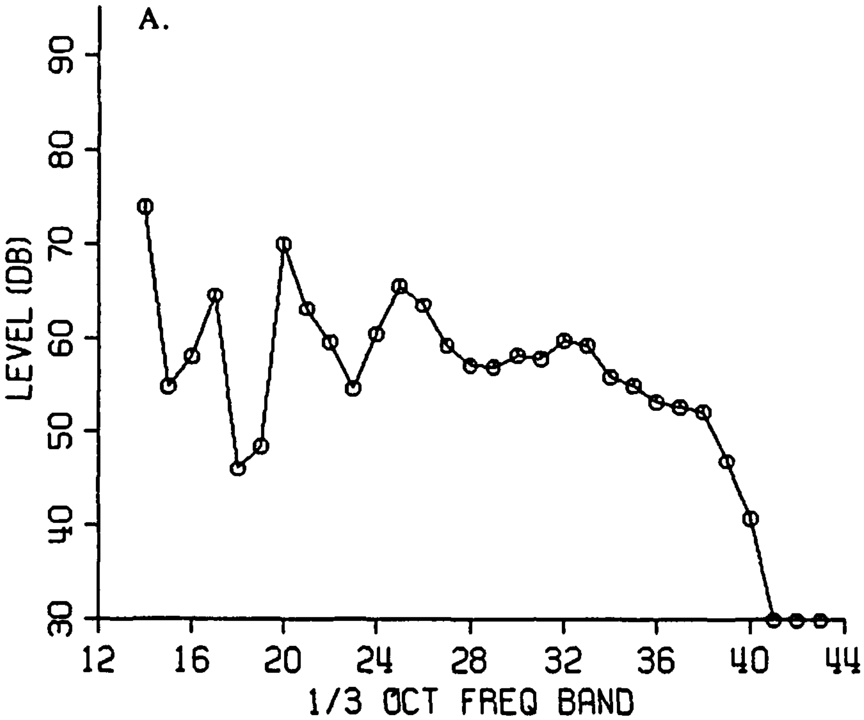


FIGURE C-C-1-2: EVENT C27 - TAKEOFF - 07/23/91
SCHWEIZER 300 - CONFIGURATION C
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



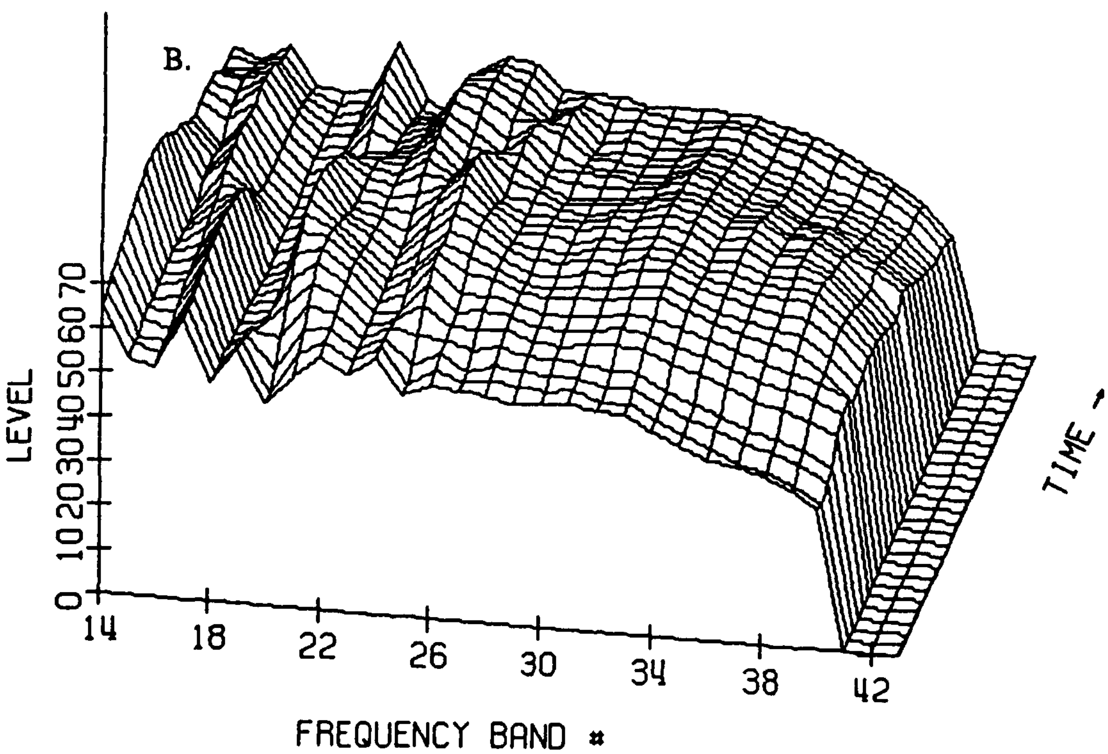
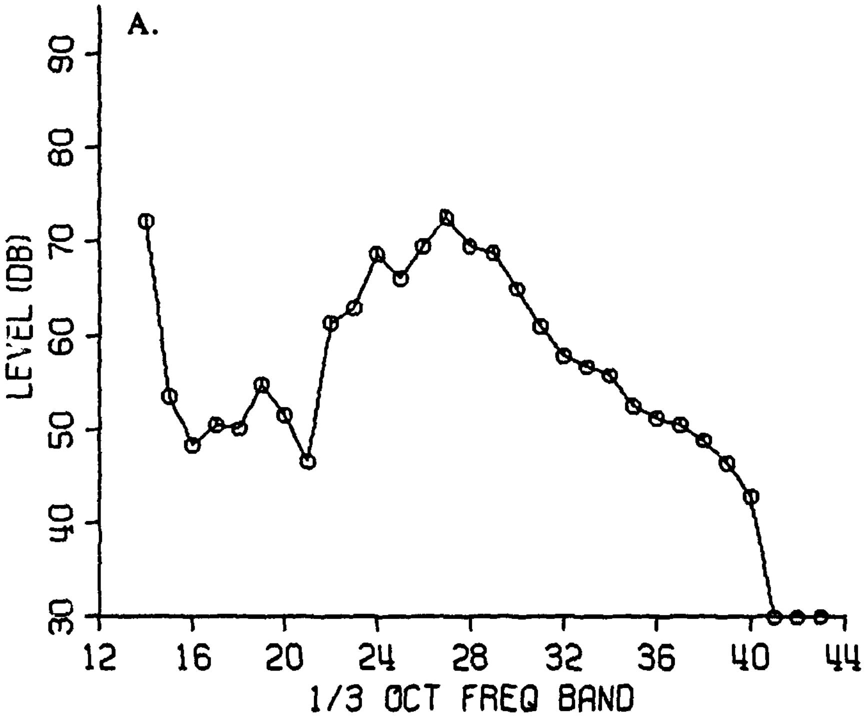


FIGURE C-C-1-3: EVENT A1 - LEVEL FLYOVER - 07/23/91
SCHWEIZER 300 - CONFIGURATION C
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



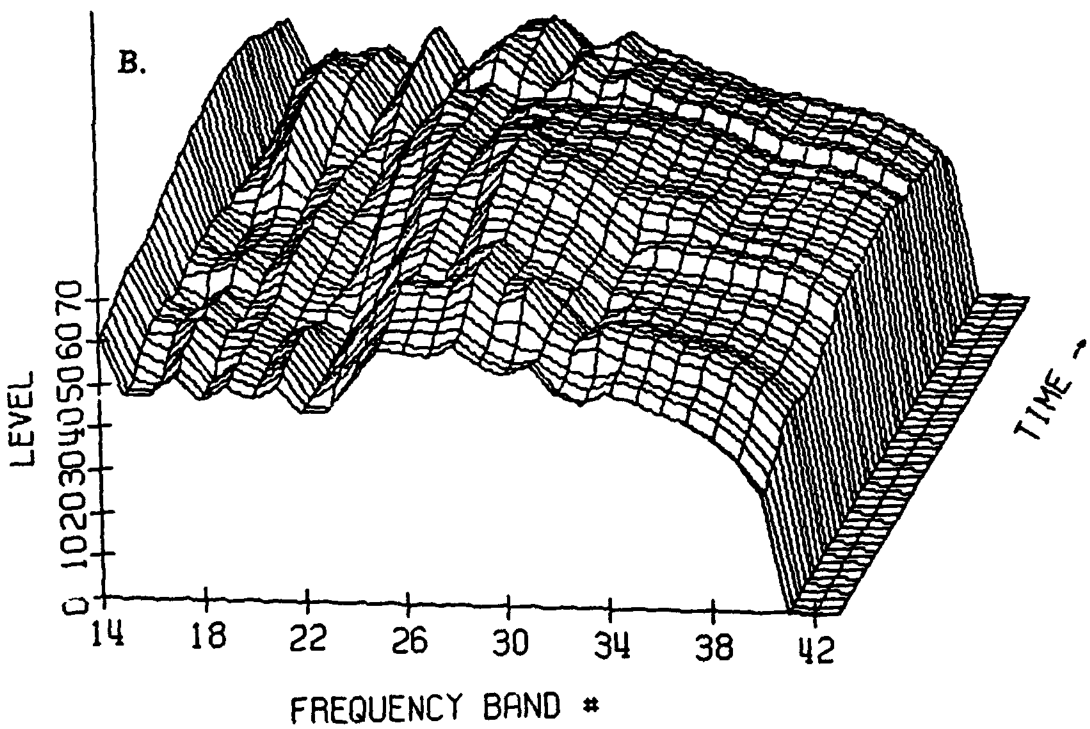
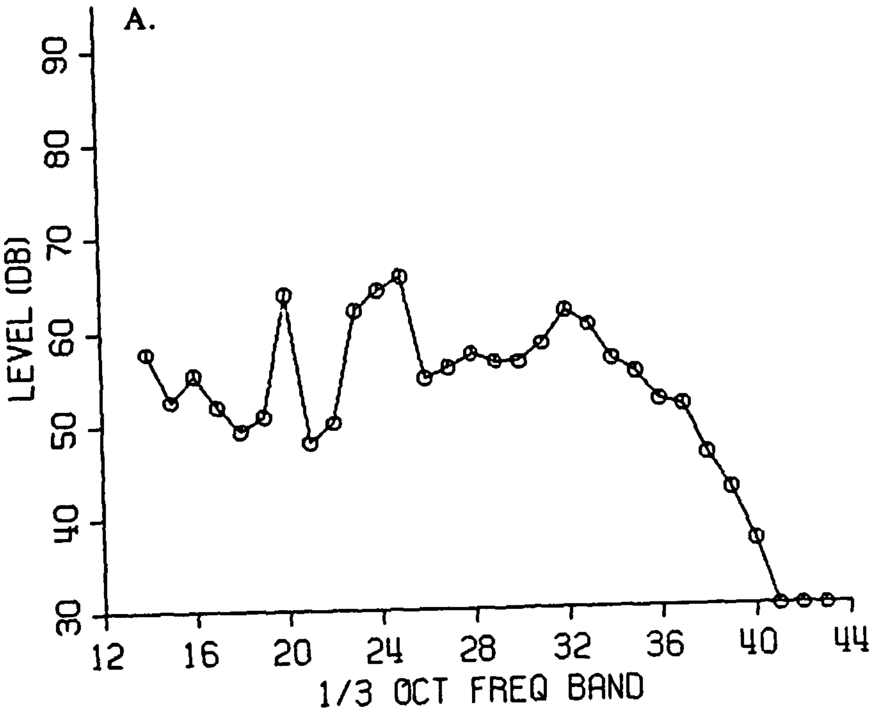


FIGURE C-C-2-1: EVENT B24 - APPROACH - 07/23/91
SCHWEIZER 300 - CONFIGURATION C
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



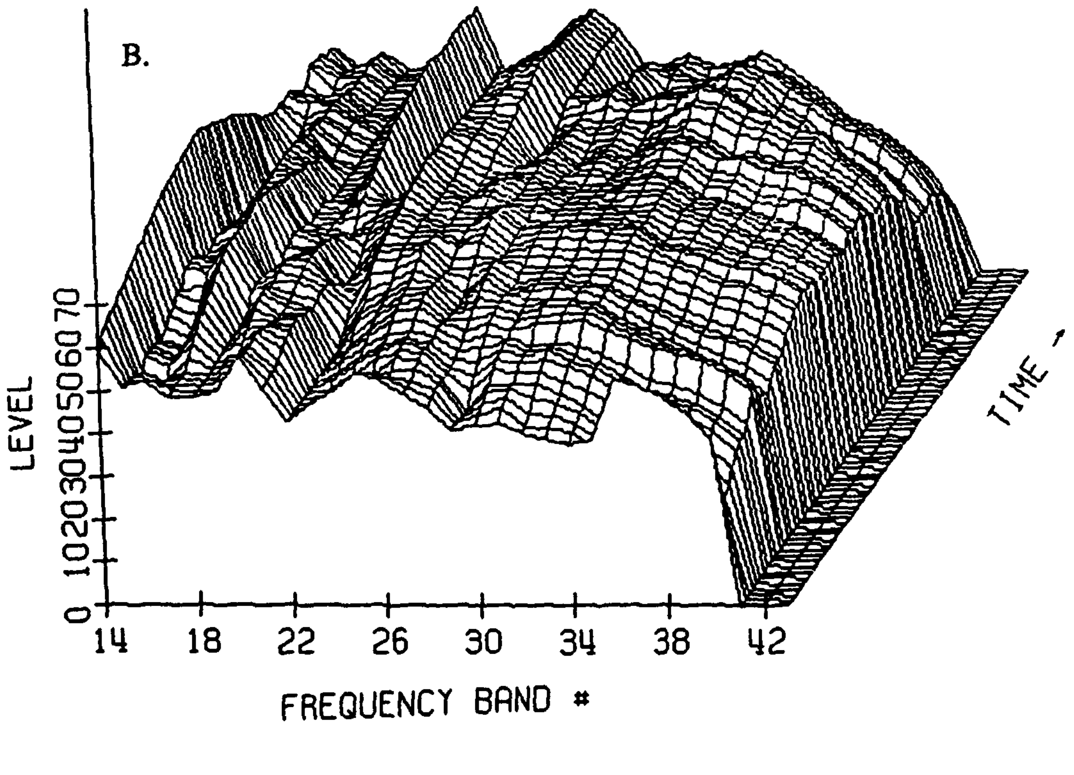
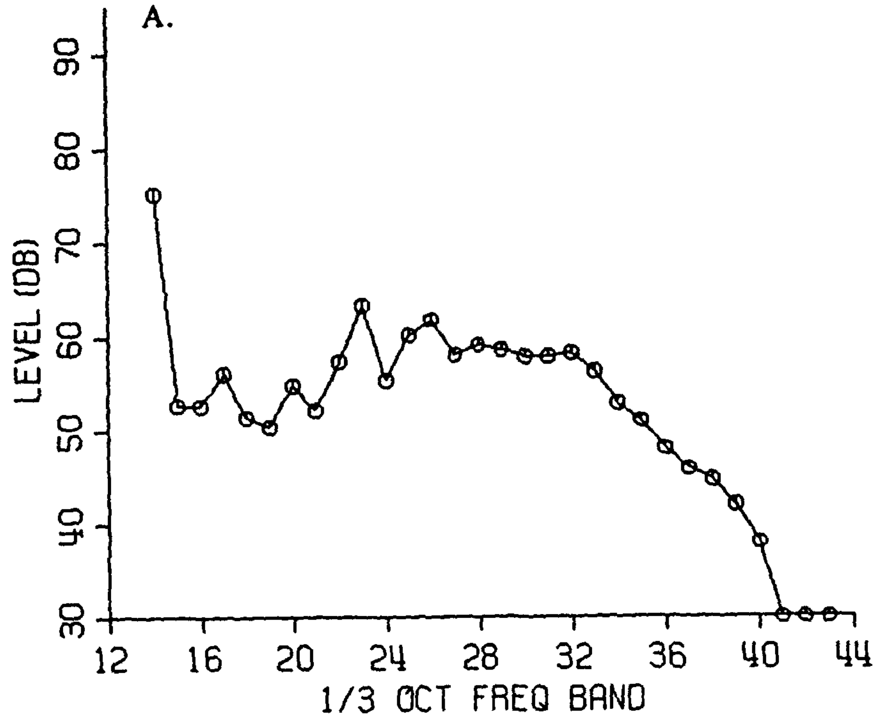


FIGURE C-C-2-2: EVENT C27 - TAKEOFF - 07/23/91
SCHWEIZER 300 - CONFIGURATION C
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



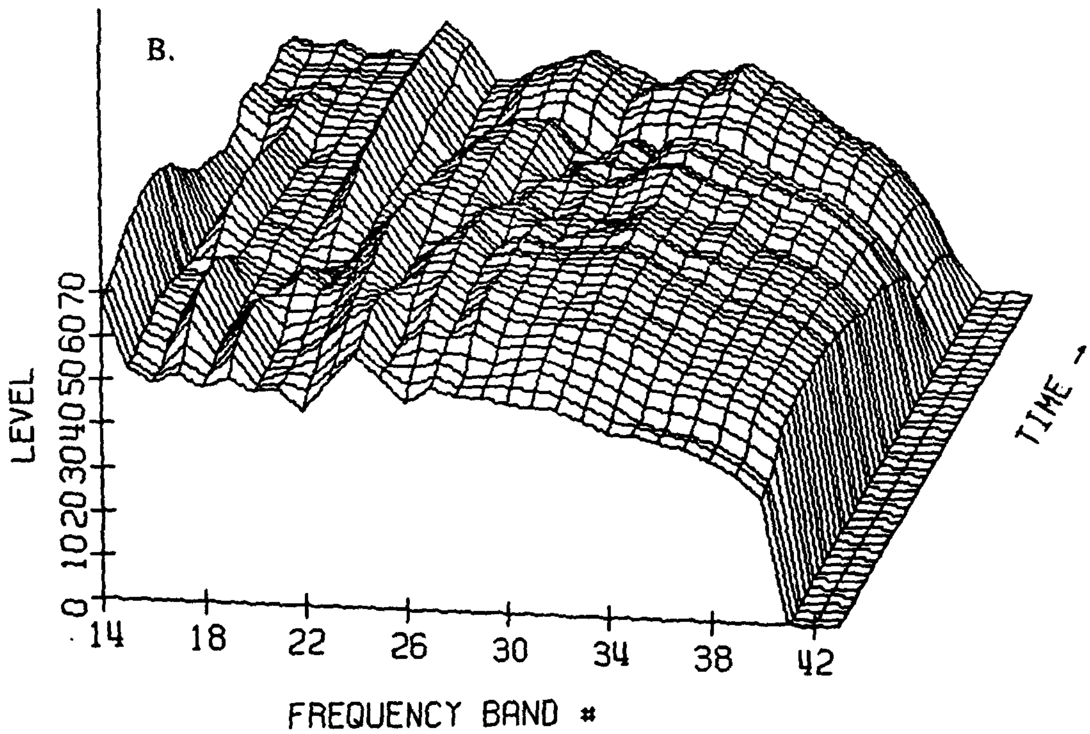
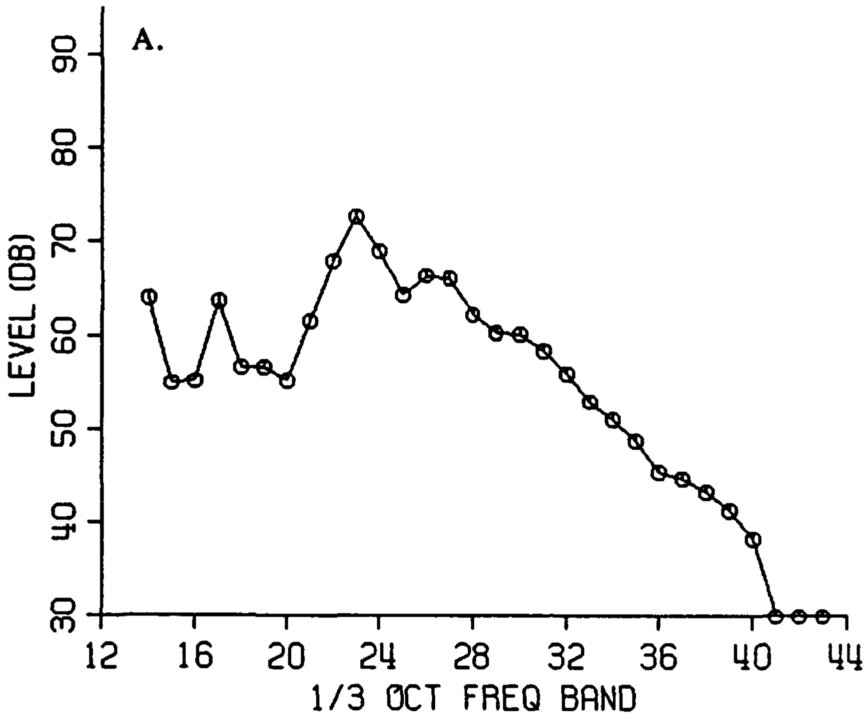


FIGURE C-C-2-3: EVENT A1 - LEVEL FLYOVER - 07/23/91
SCHWEIZER 300 - CONFIGURATION C
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



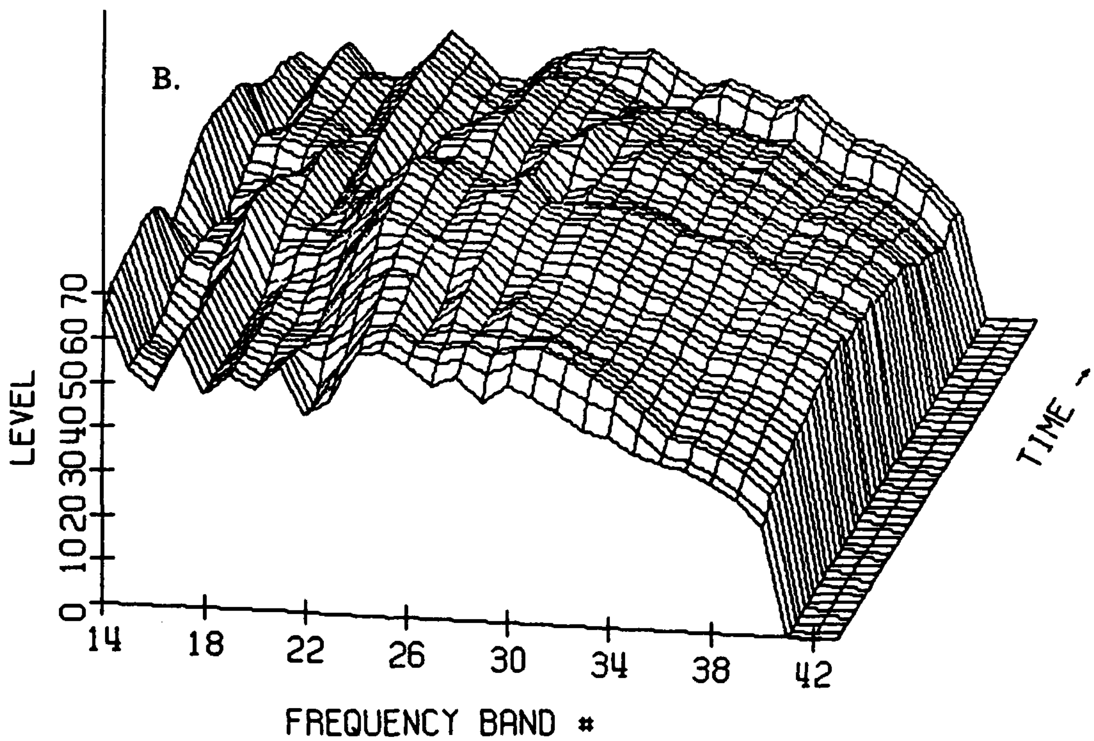
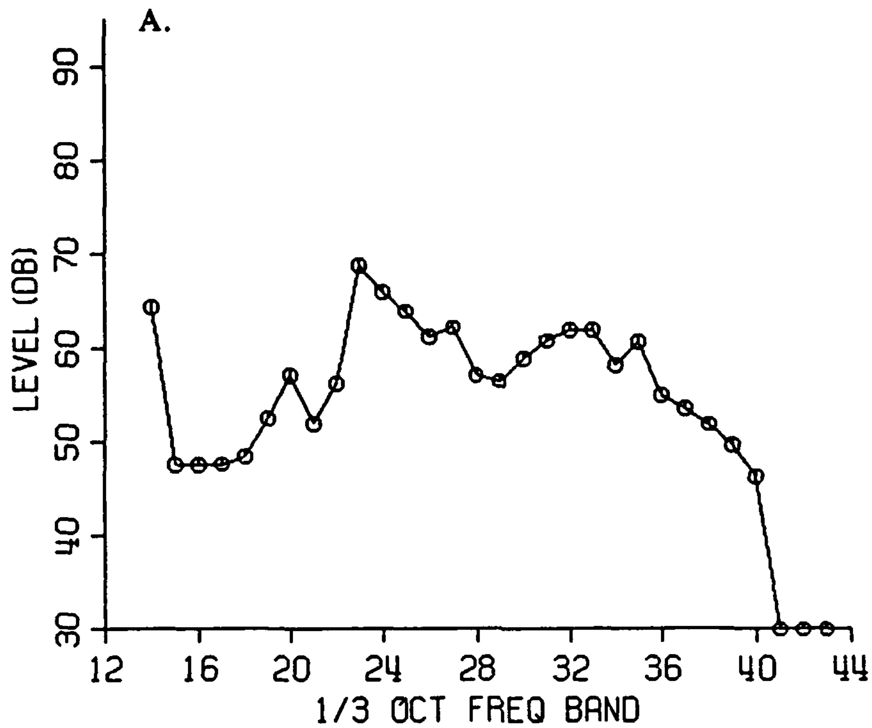


FIGURE C-C-3-1: EVENT B24 - APPROACH - 07/23/91
SCHWEIZER 300 - CONFIGURATION C
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



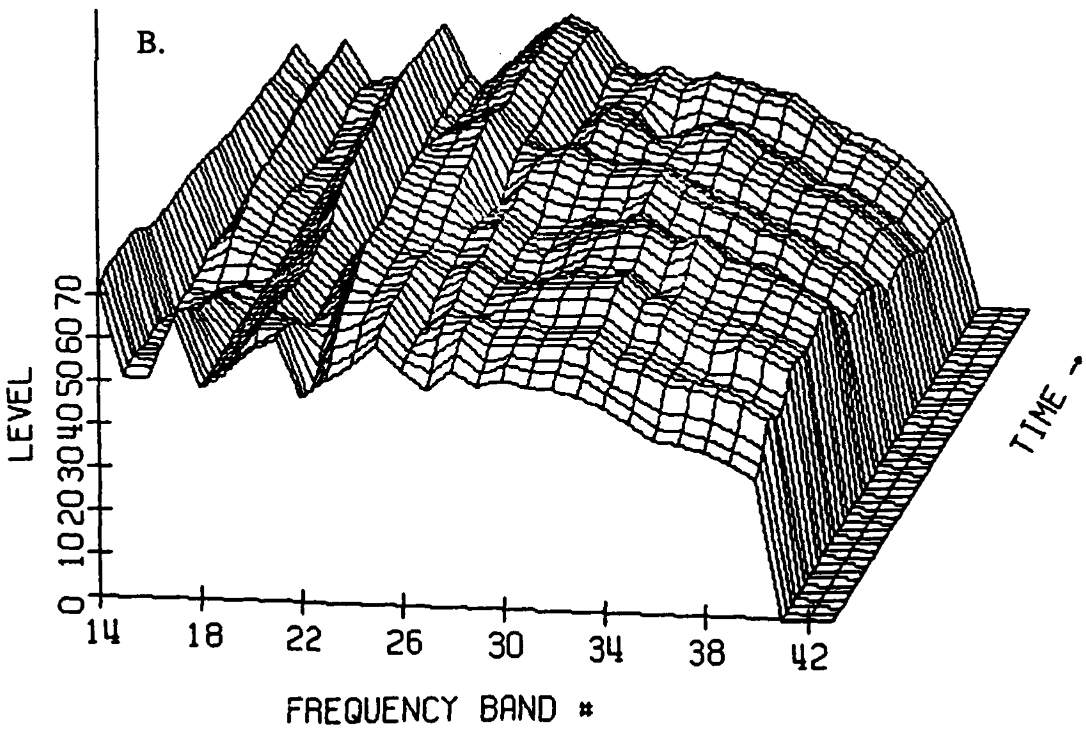
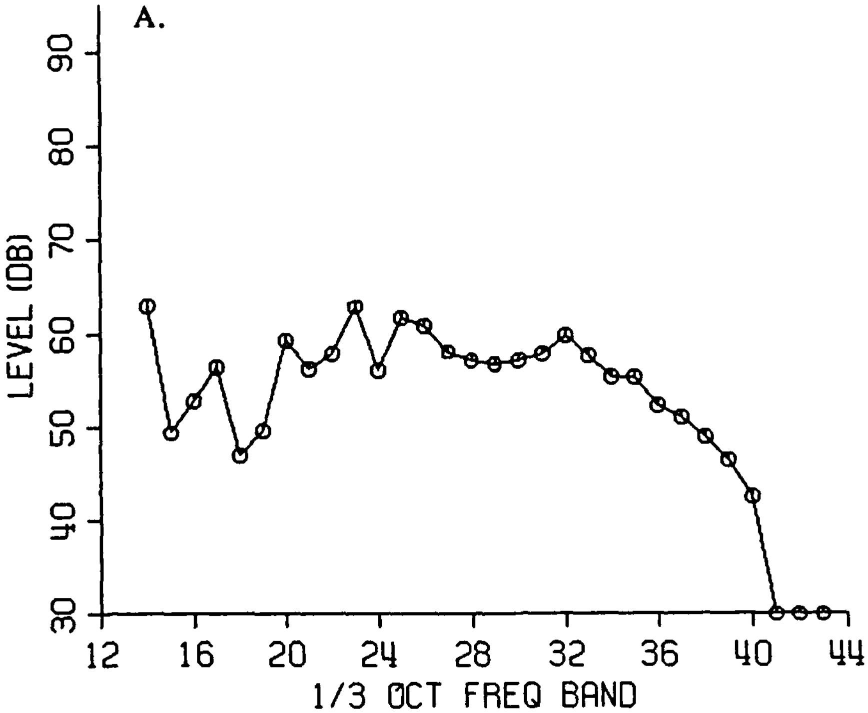


FIGURE C-C-3-2: EVENT C27 - TAKEOFF - 07/23/91
SCHWEIZER 300 - CONFIGURATION C
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



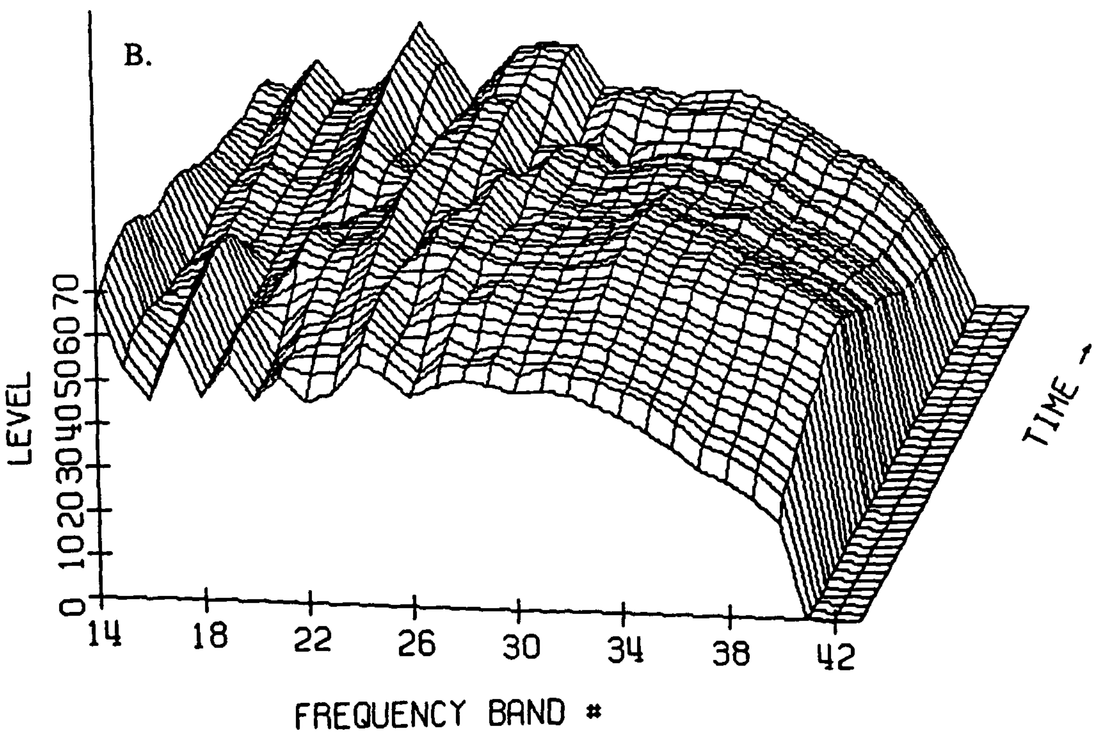
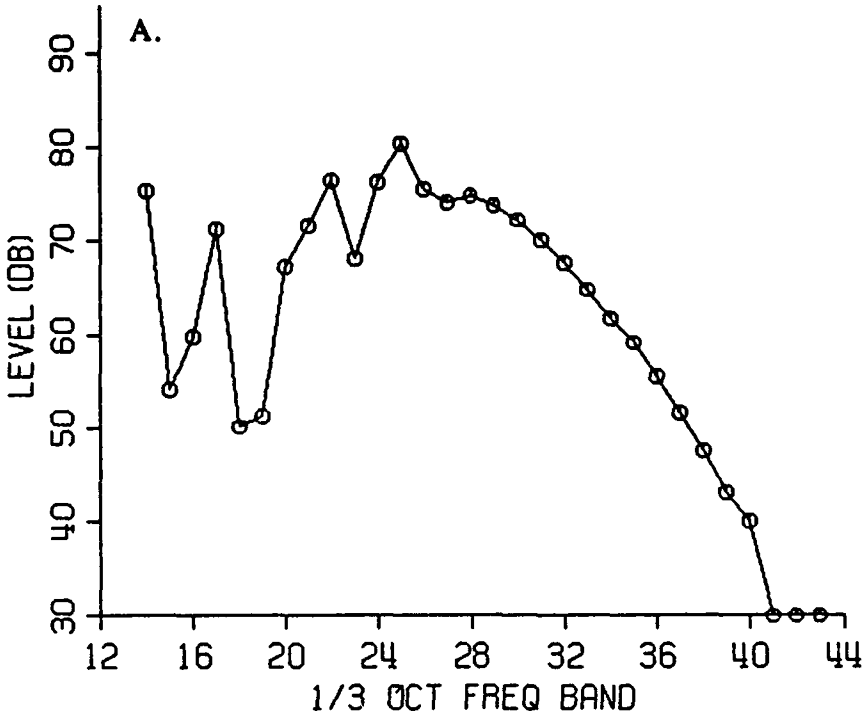


FIGURE C-C-3-3: EVENT A1 - LEVEL FLYOVER - 07/23/91
SCHWEIZER 300 - CONFIGURATION C
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



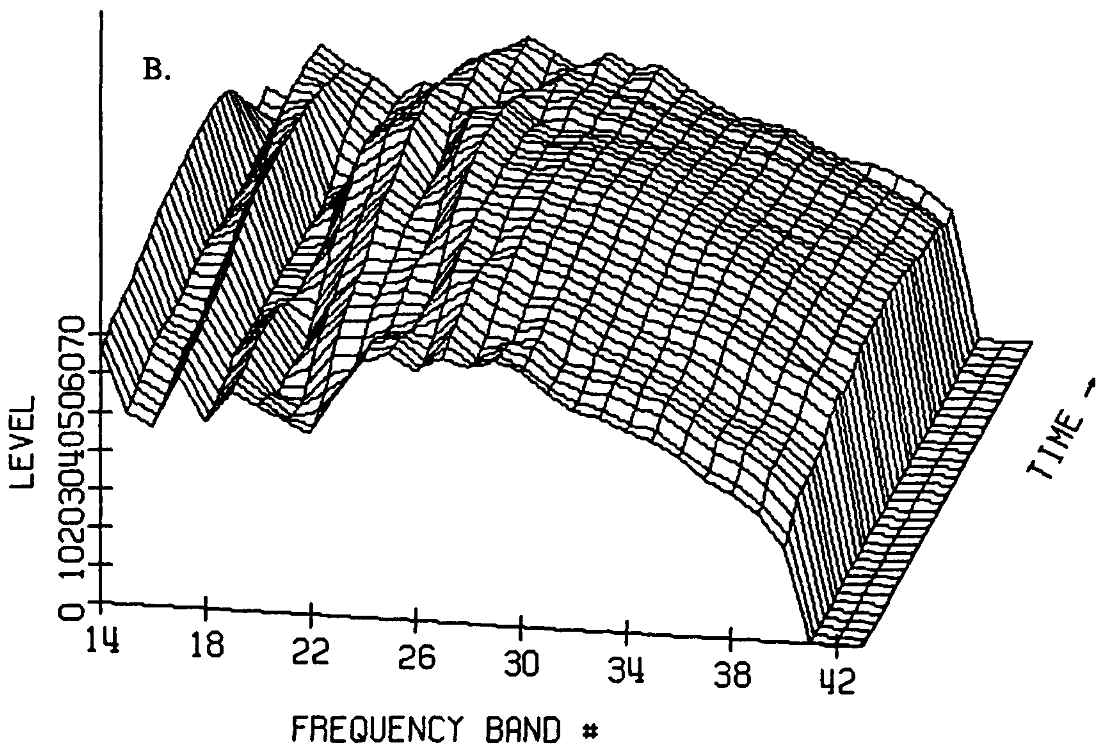
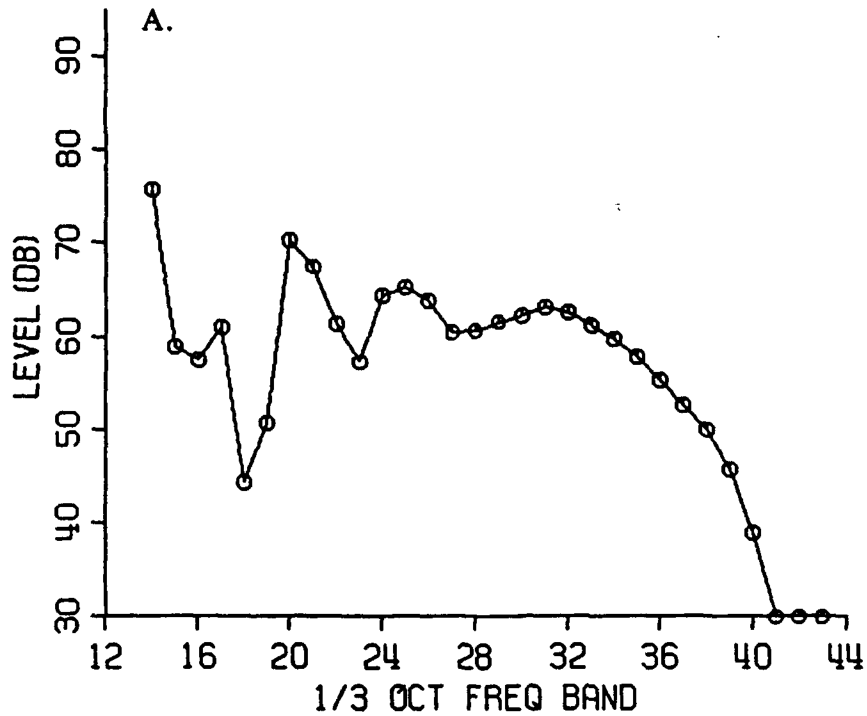


FIGURE C-D-1-1: EVENT B18 - APPROACH - 07/23/91
SCHWEIZER 300 - CONFIGURATION D
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



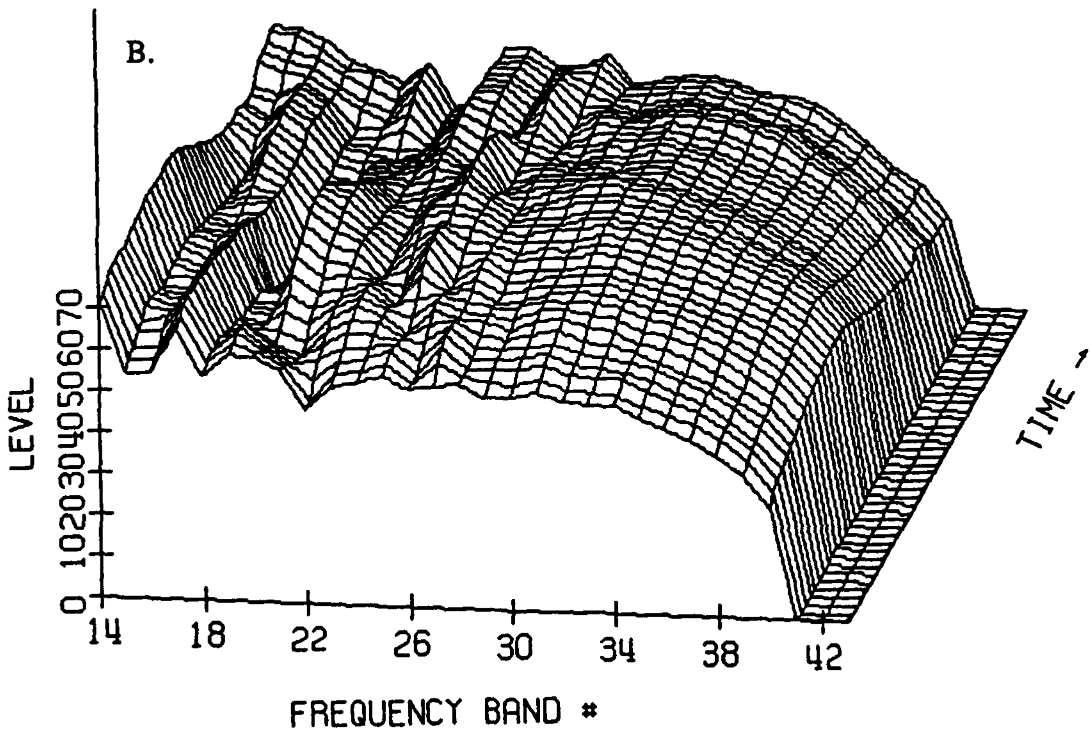
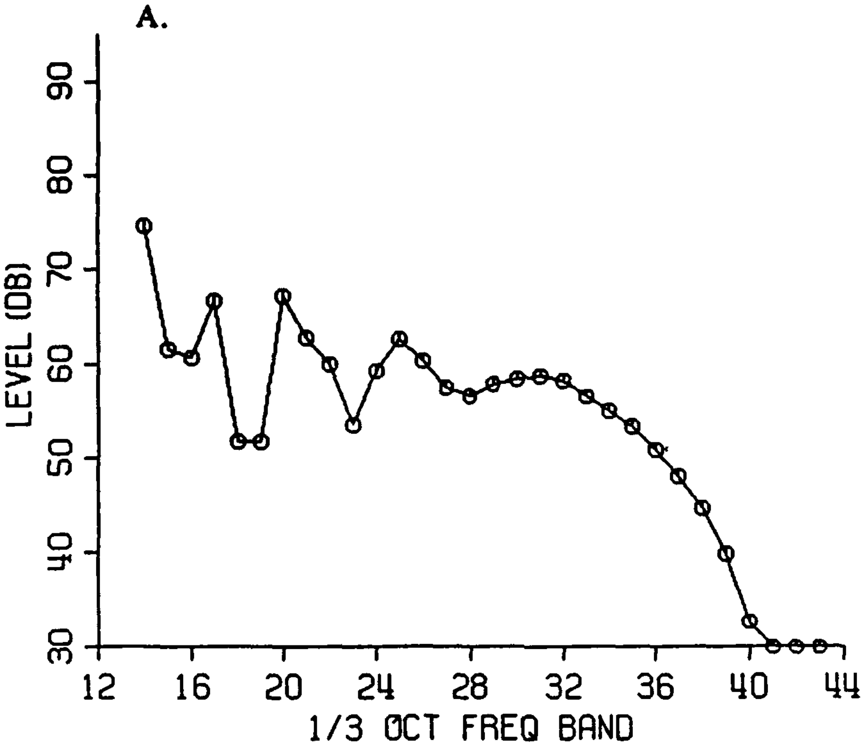


FIGURE C-D-1-2: EVENT C28 - TAKEOFF - 07/23/91
SCHWEIZER 300 - CONFIGURATION D
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



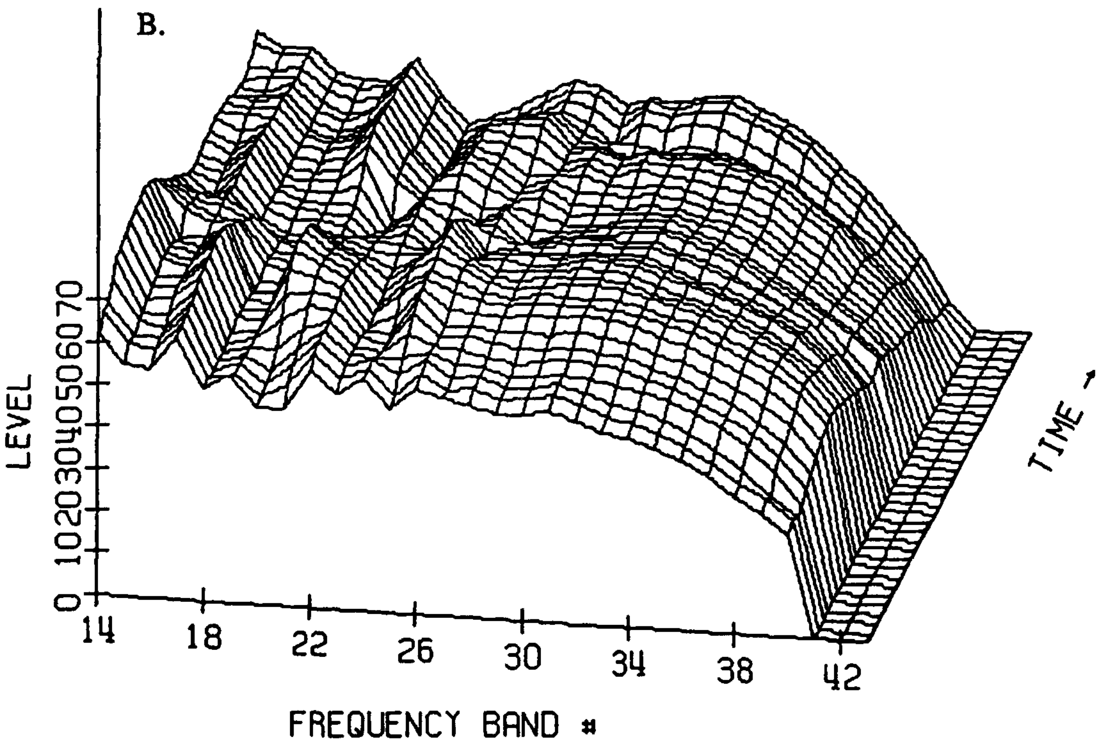
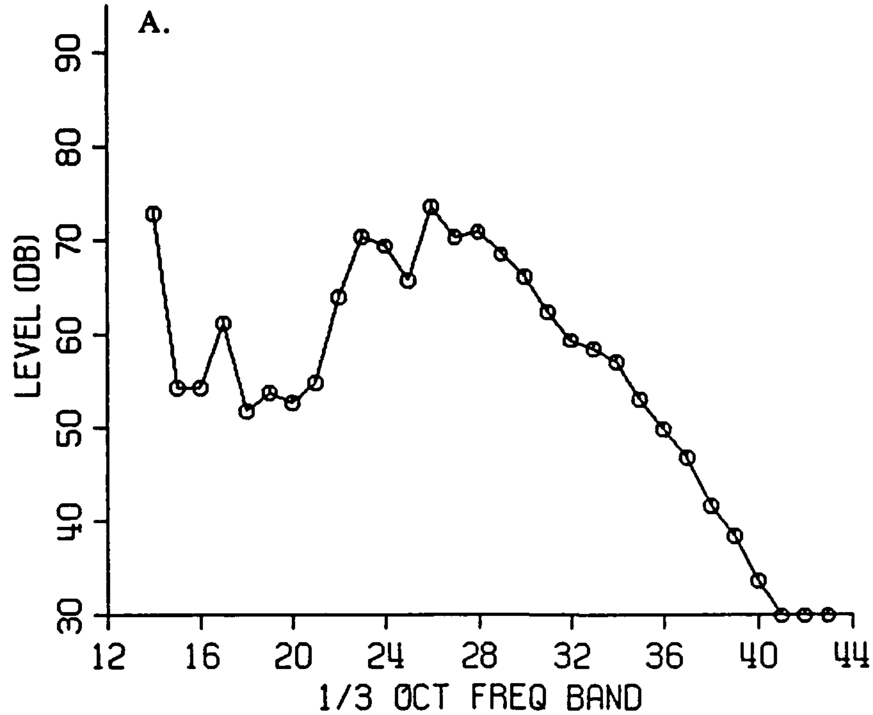


FIGURE C-D-1-3: EVENT A5 - LEVEL FLYOVER - 07/23/91
SCHWEIZER 300 - CONFIGURATION D
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



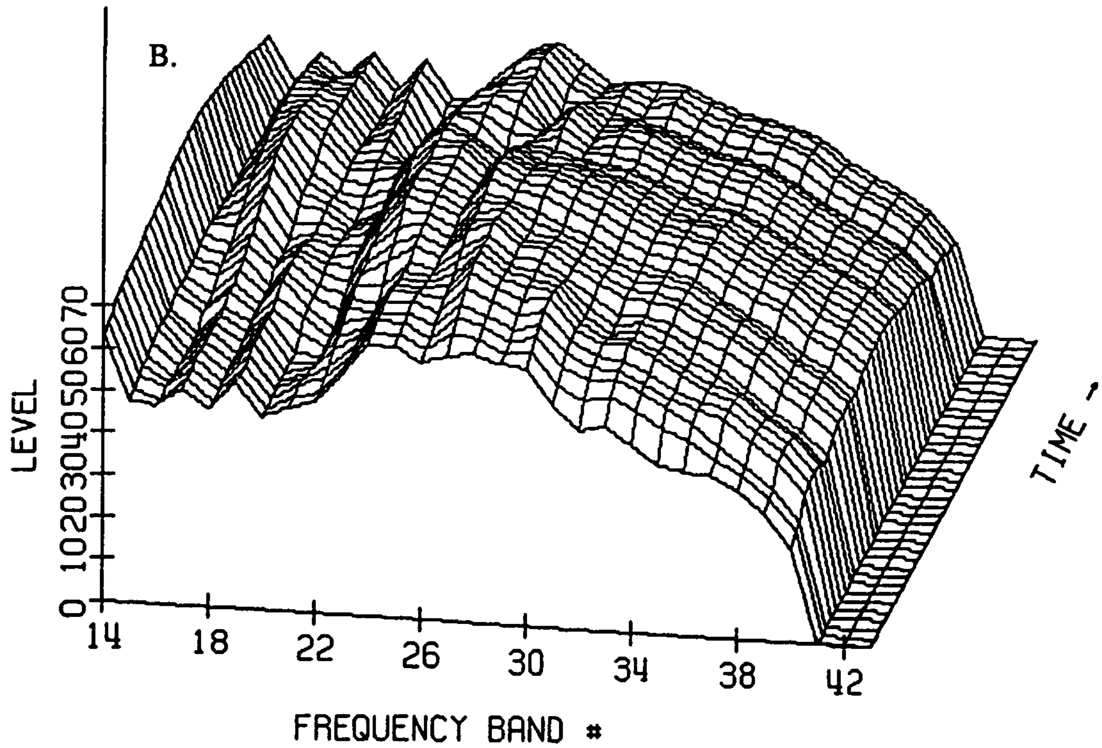
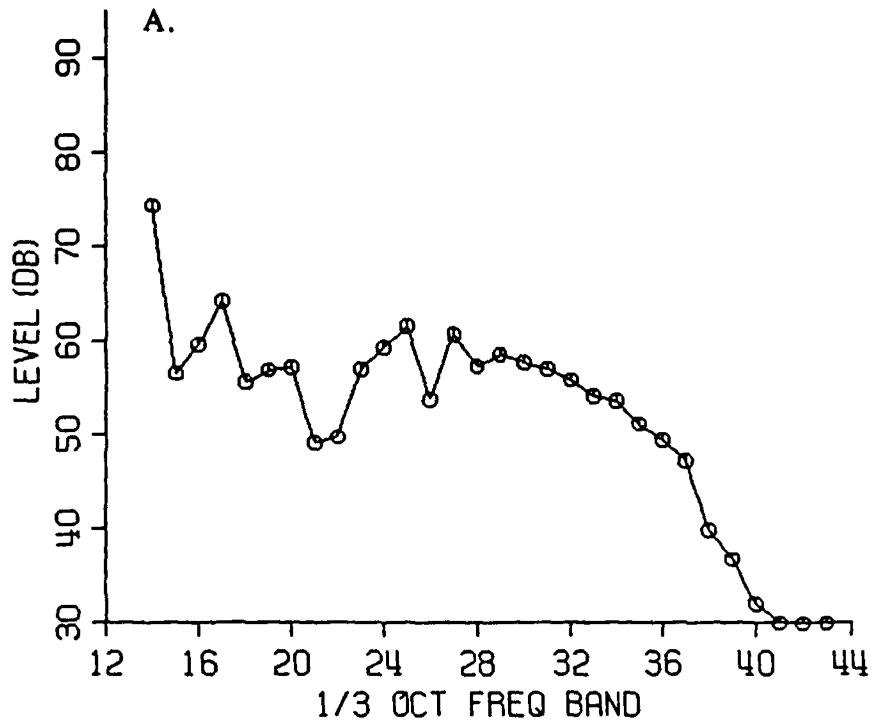


FIGURE C-D-2-1: EVENT B18 - APPROACH - 07/23/91
SCHWEIZER 300 - CONFIGURATION D
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



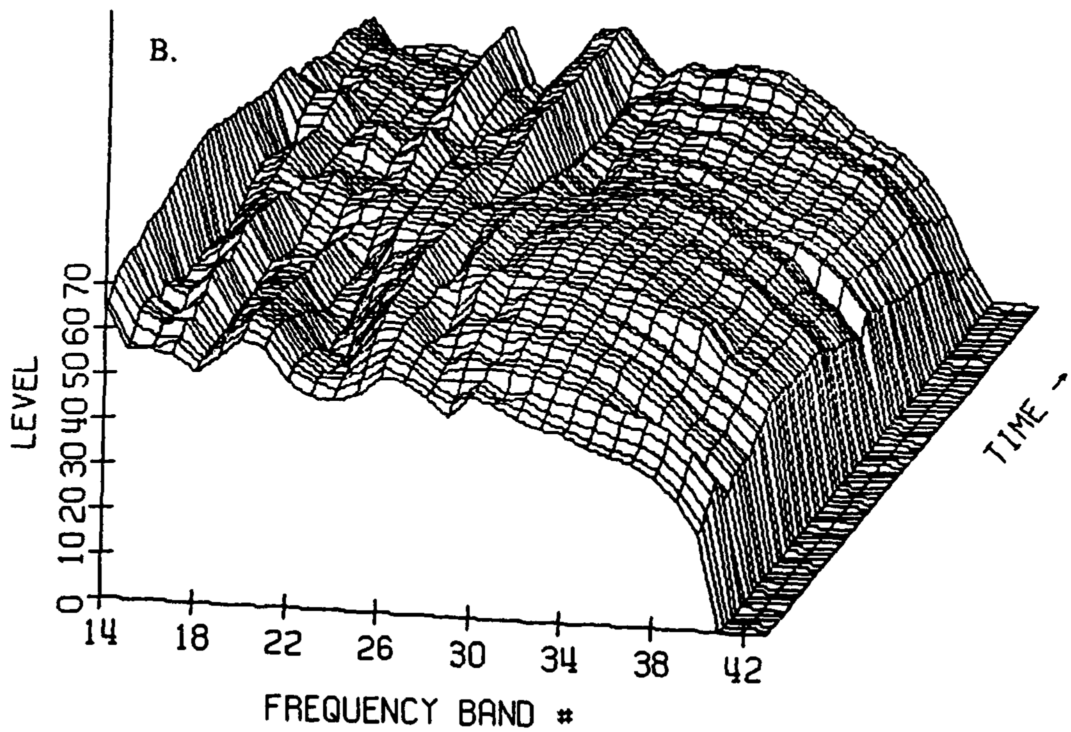
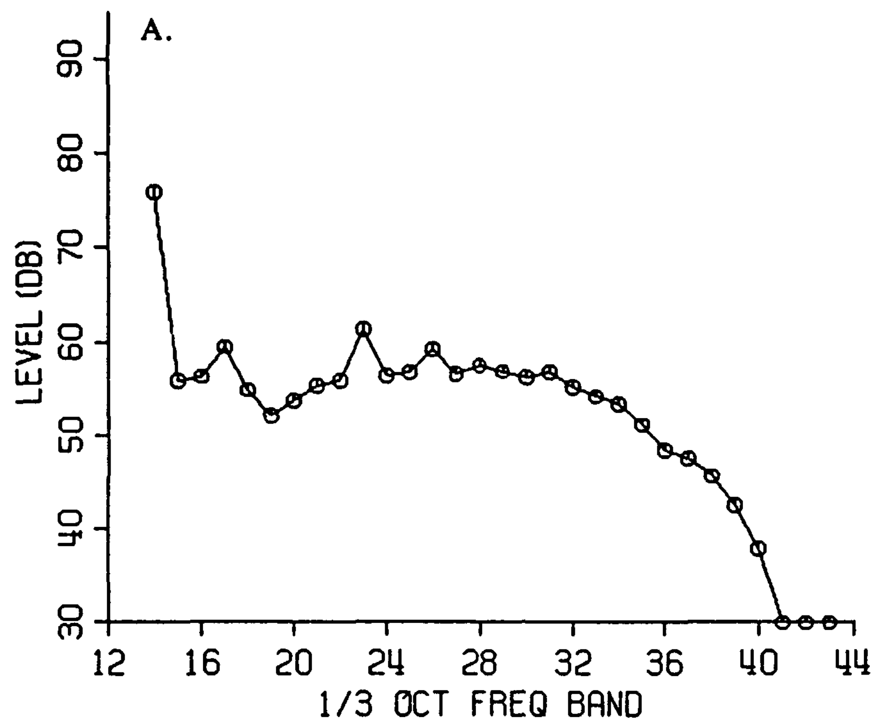


FIGURE C-D-2-2: EVENT C28 - TAKEOFF - 07/23/91
SCHWEIZER 300 - CONFIGURATION D
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



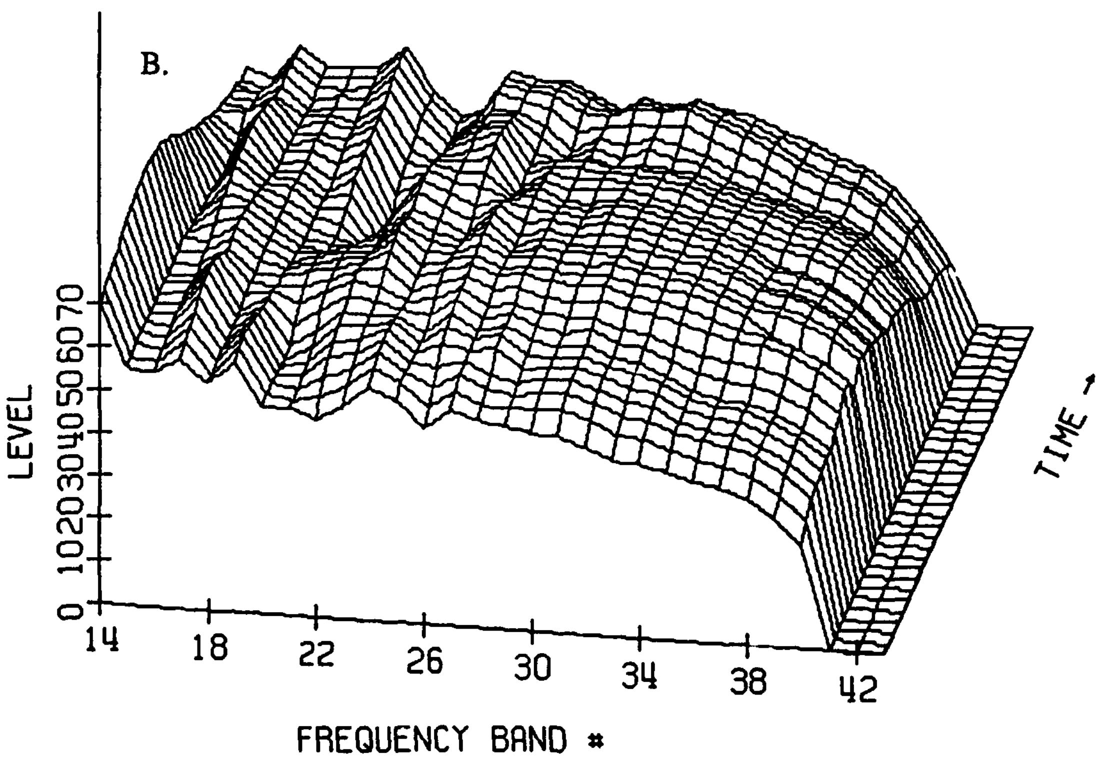
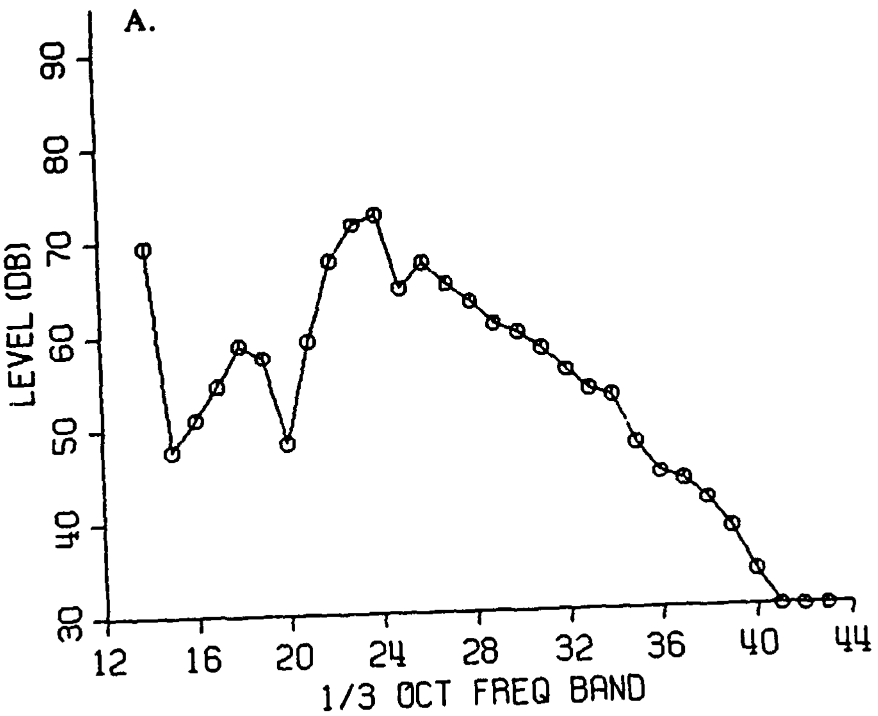


FIGURE C-D-2-3: EVENT A5 - LEVEL FLYOVER - 07/23/91
SCHWEIZER 300 - CONFIGURATION D
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



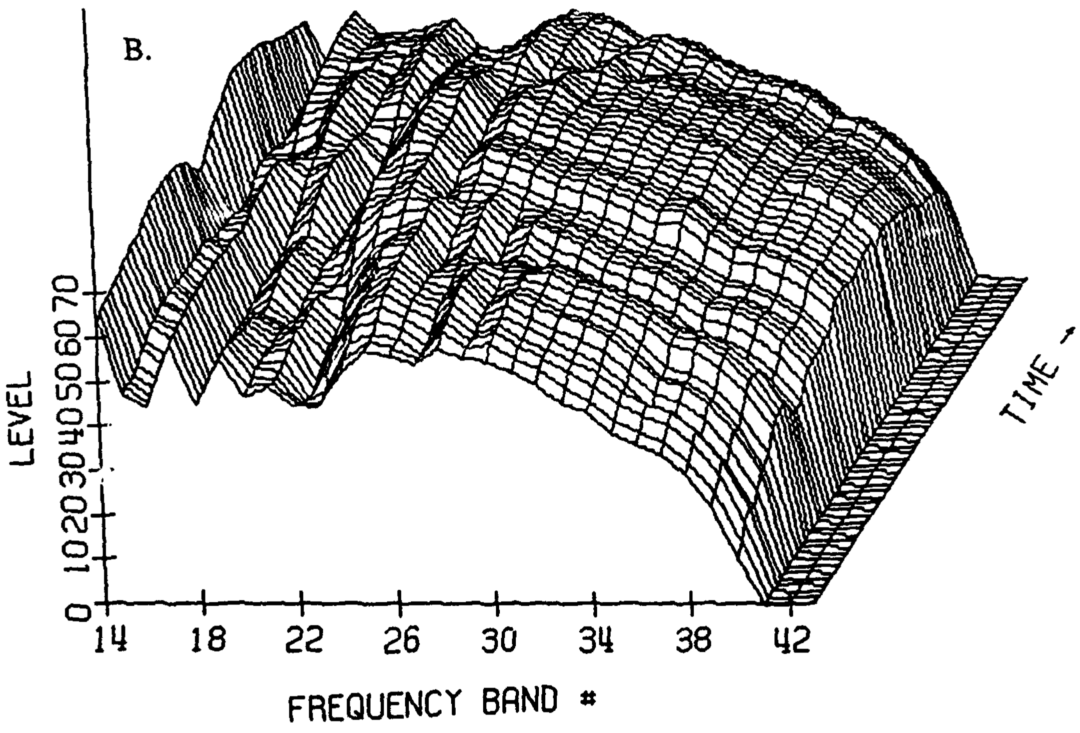
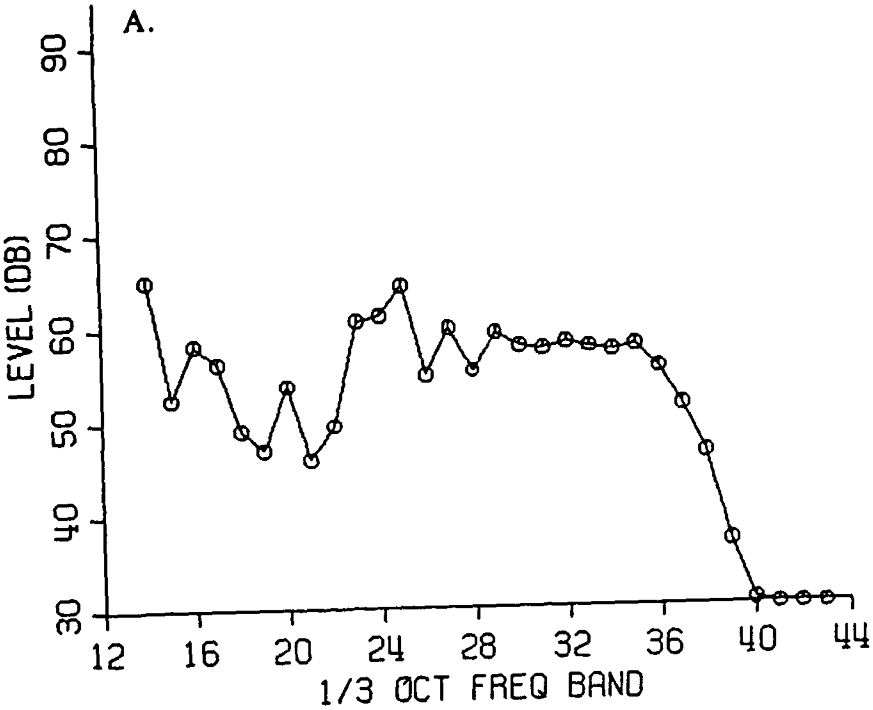


FIGURE C-D-3-1: EVENT B18 - APPROACH - 07/23/91
SCHWEIZER 300 - CONFIGURATION D
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



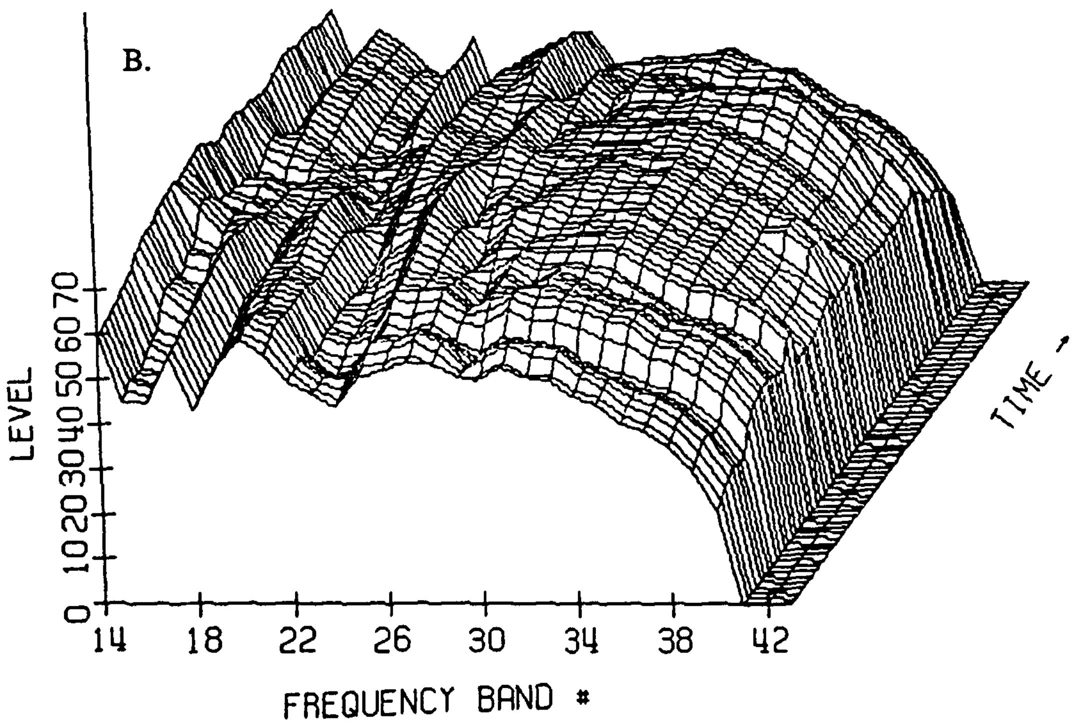


FIGURE C-D-3-2: EVENT C28 - TAKEOFF - 07/23/91
SCHWEIZER 300 - CONFIGURATION D
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

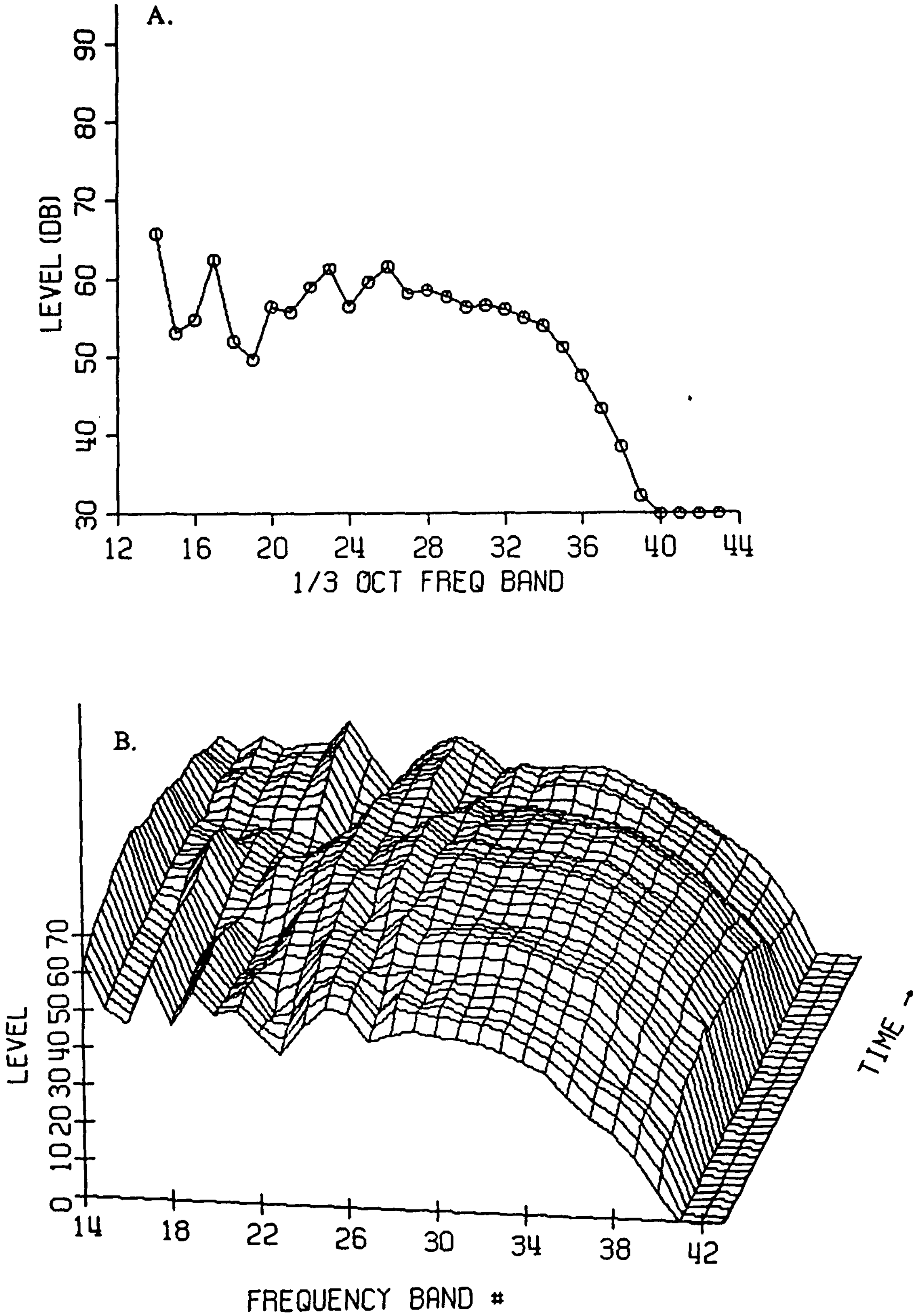
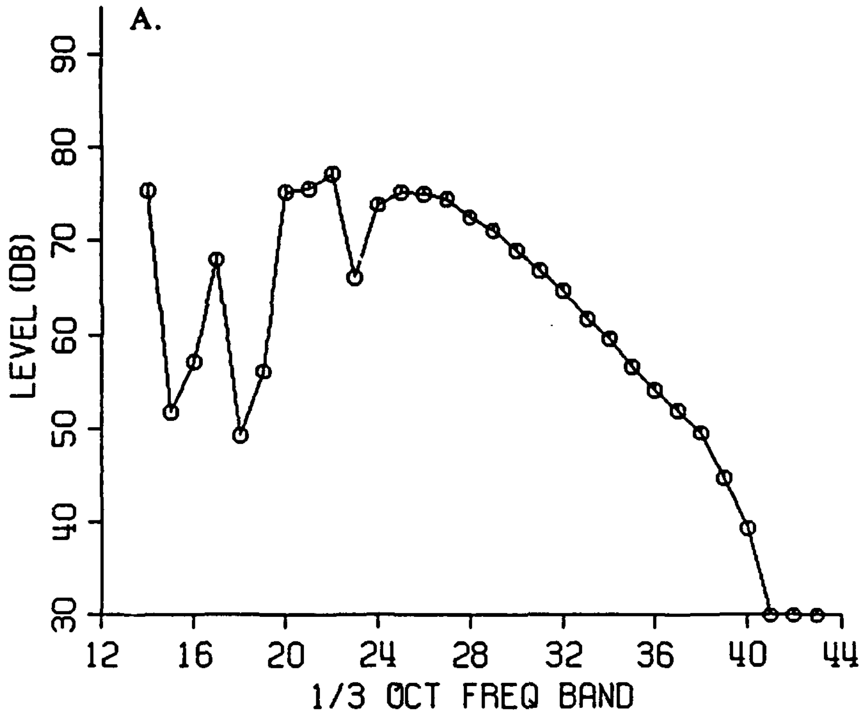


FIGURE C-D-3-3: EVENT A5 - LEVEL FLYOVER - 07/23/91
SCHWEIZER 300 - CONFIGURATION D
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



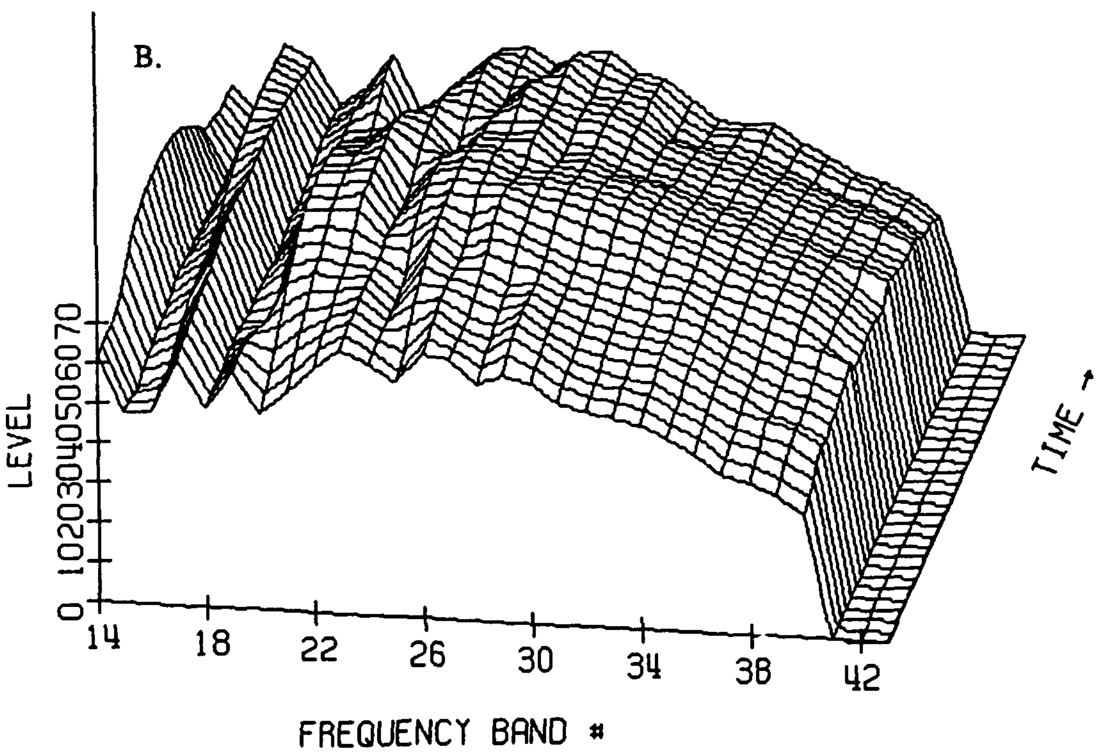
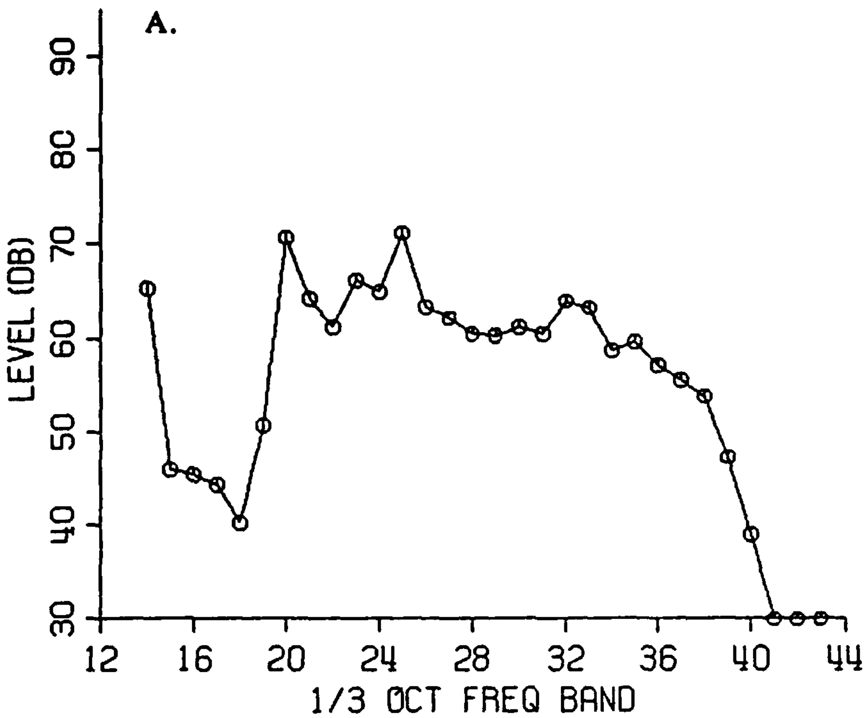


FIGURE C-E-1-1: EVENT B15 - APPROACH - 07/24/91
SCHWEIZER 300 - CONFIGURATION E
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



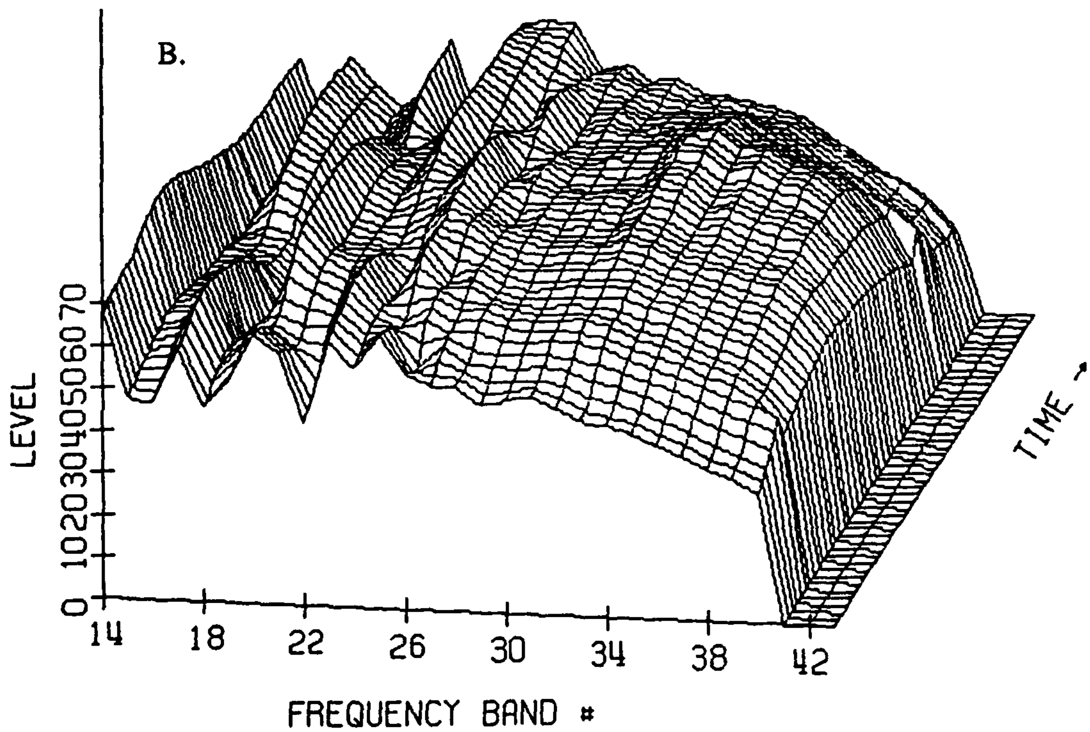
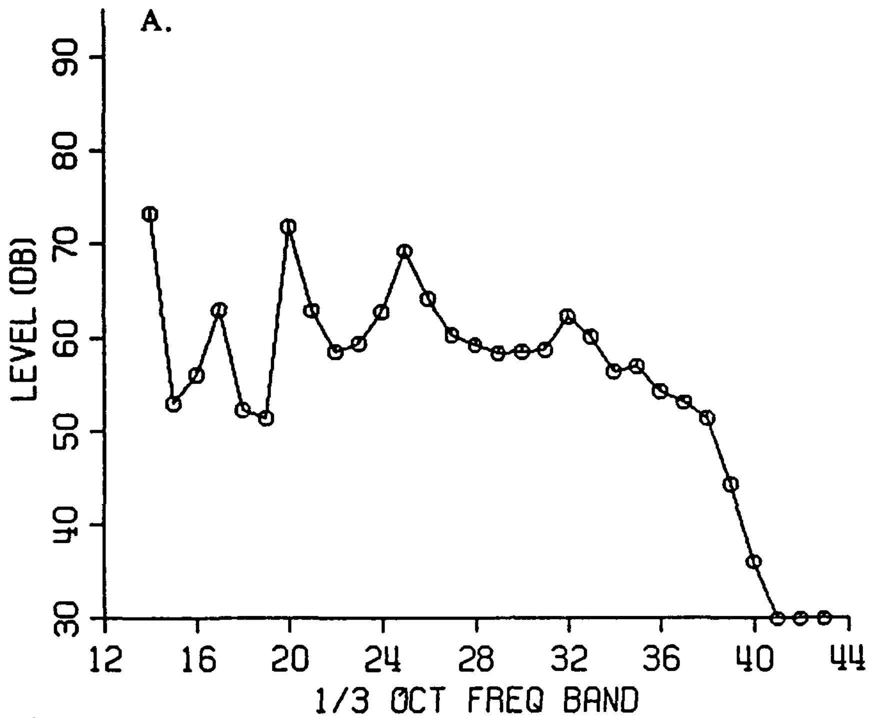


FIGURE C-E-1-2: EVENT E7 - TAKEOFF - 07/24/91
SCHWEIZER 300 - CONFIGURATION E
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



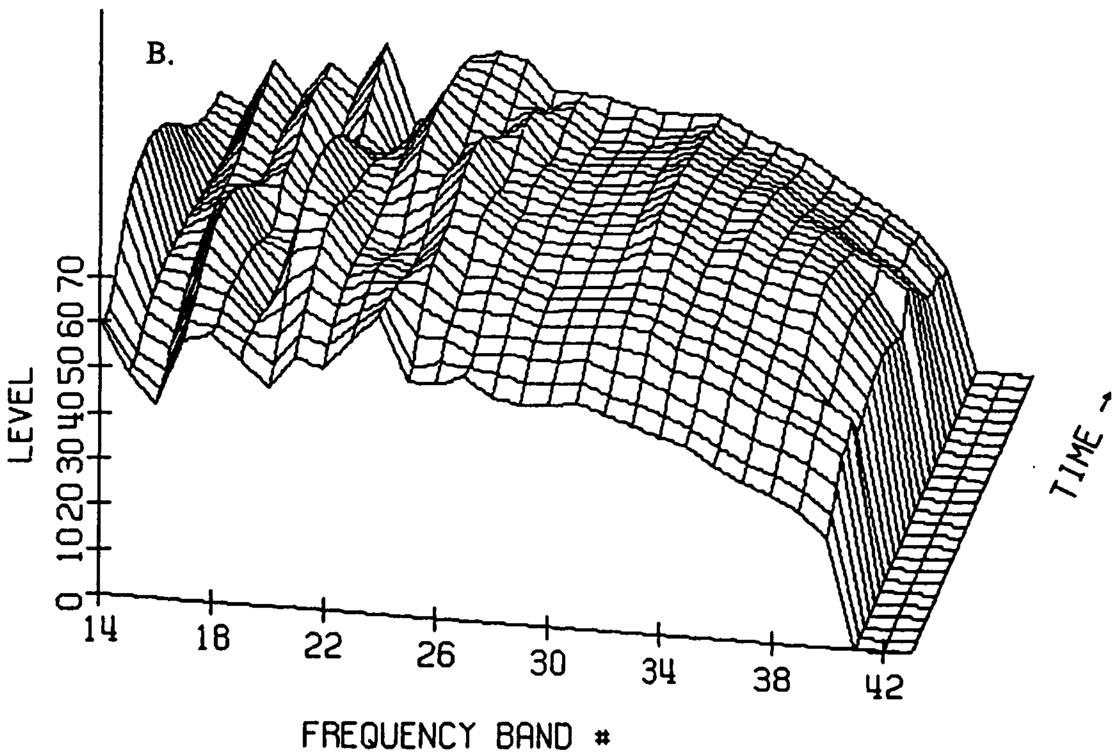
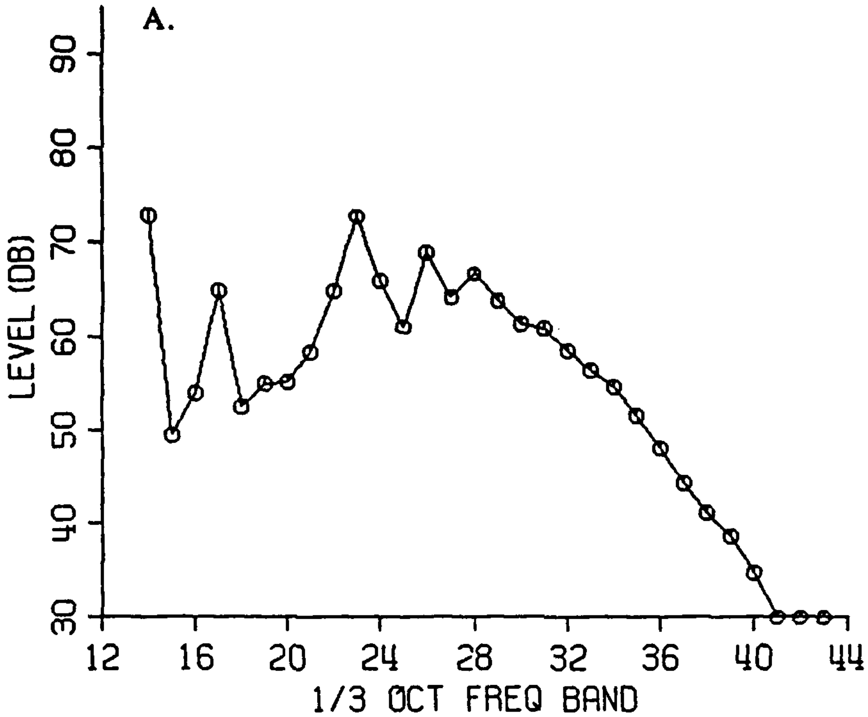


FIGURE C-E-1-3: EVENT A3 - LEVEL FLYOVER - 07/24/91
SCHWEIZER 300 - CONFIGURATION E
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



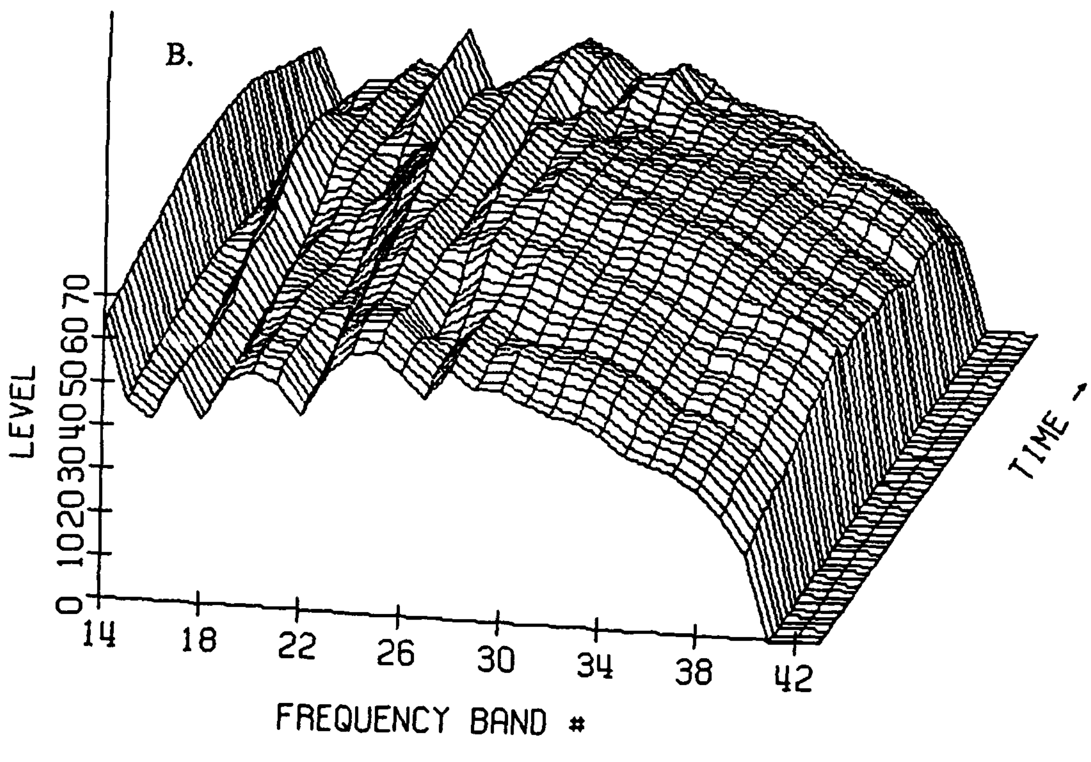
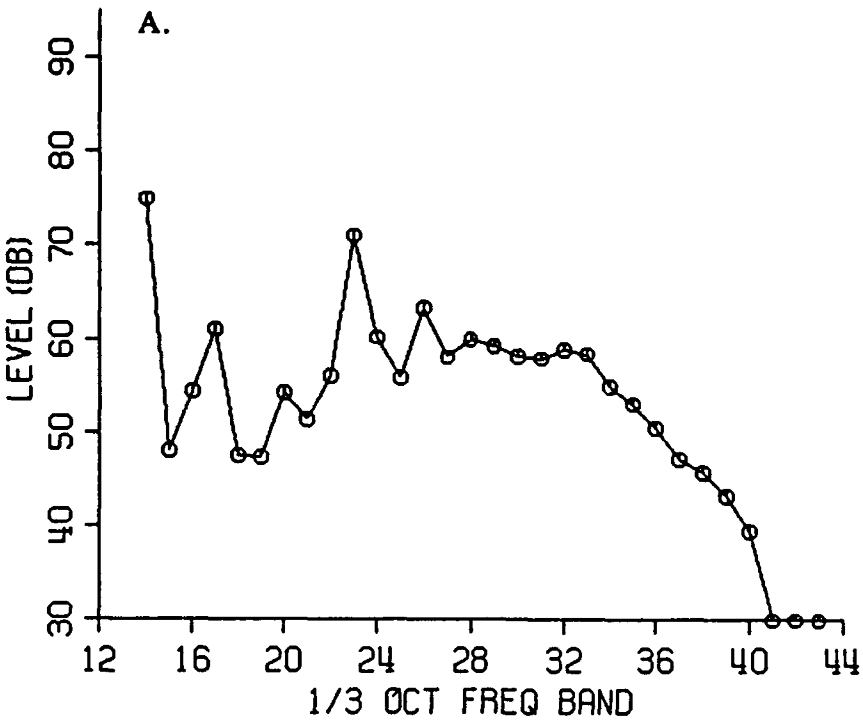


FIGURE C-E-2-1: EVENT B15 - APPROACH - 07/24/91
SCHWEIZER 300 - CONFIGURATION E
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



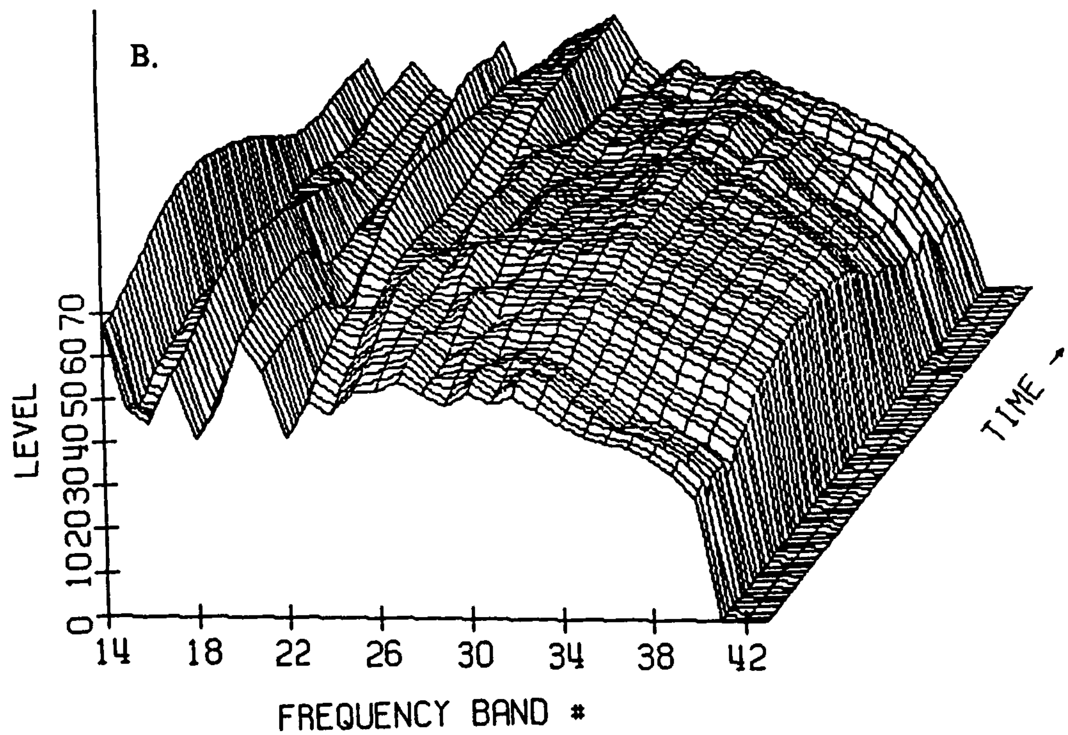
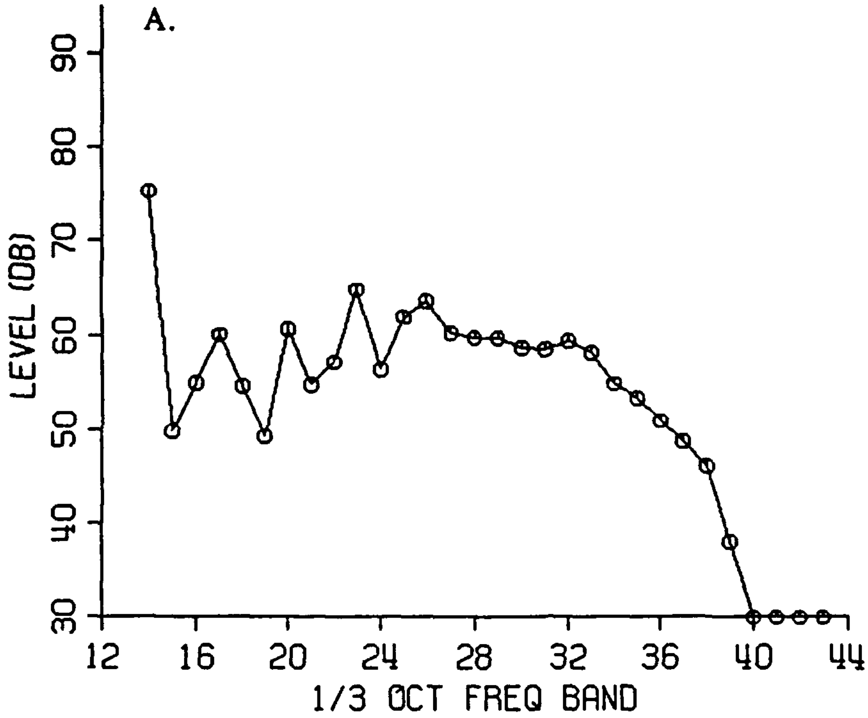


FIGURE C-E-2-2: EVENT E7 - TAKEOFF - 07/24/91
SCHWEIZER 300 - CONFIGURATION E
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



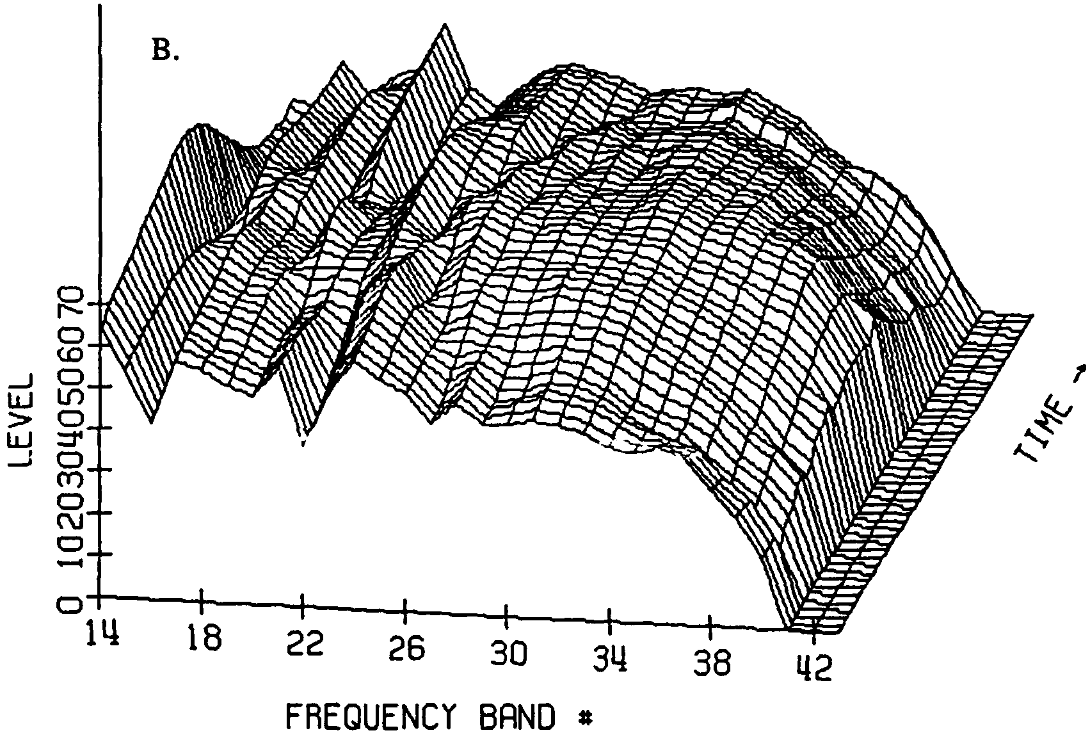
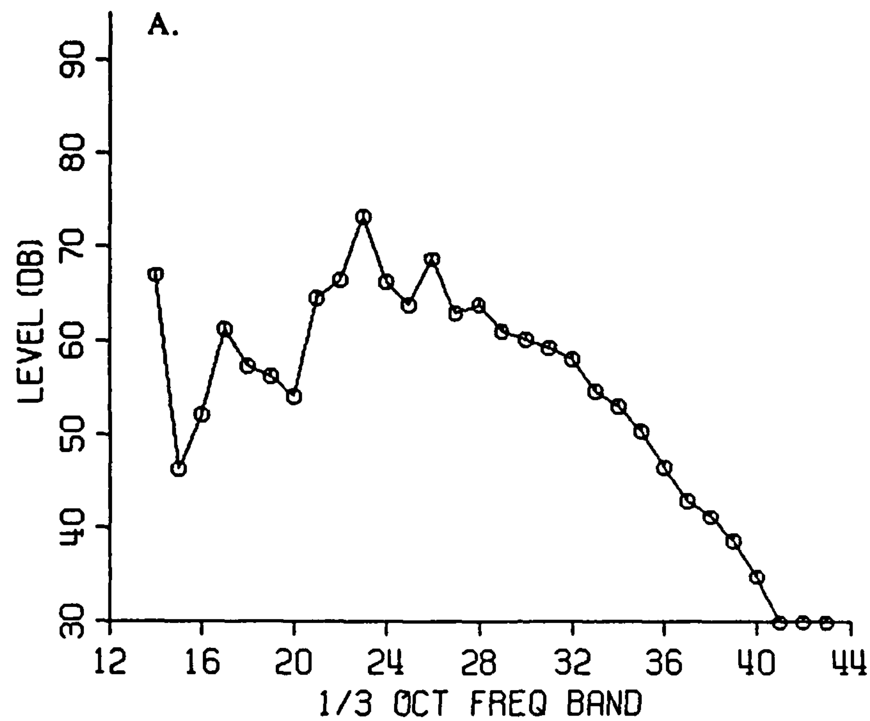


FIGURE C-E-2-3: EVENT A3 - LEVEL FLYOVER - 07/24/91
SCHWEIZER 300 - CONFIGURATION E
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



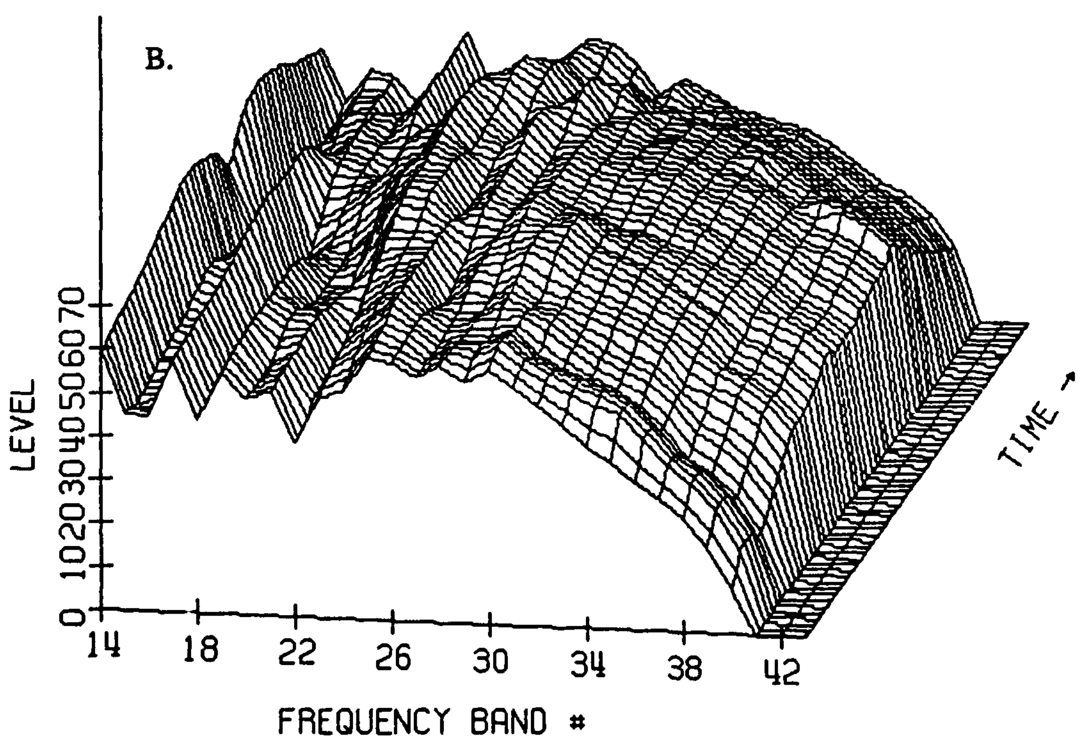
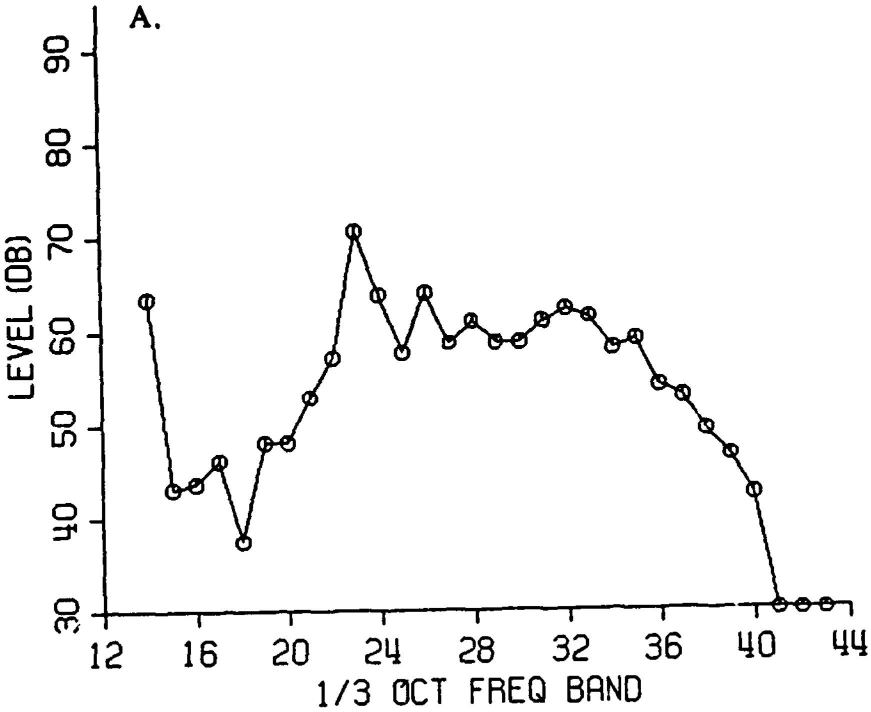


FIGURE C-E-3-1: EVENT B15 - APPROACH - 07/24/91
SCHWEIZER 300 - CONFIGURATION E
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



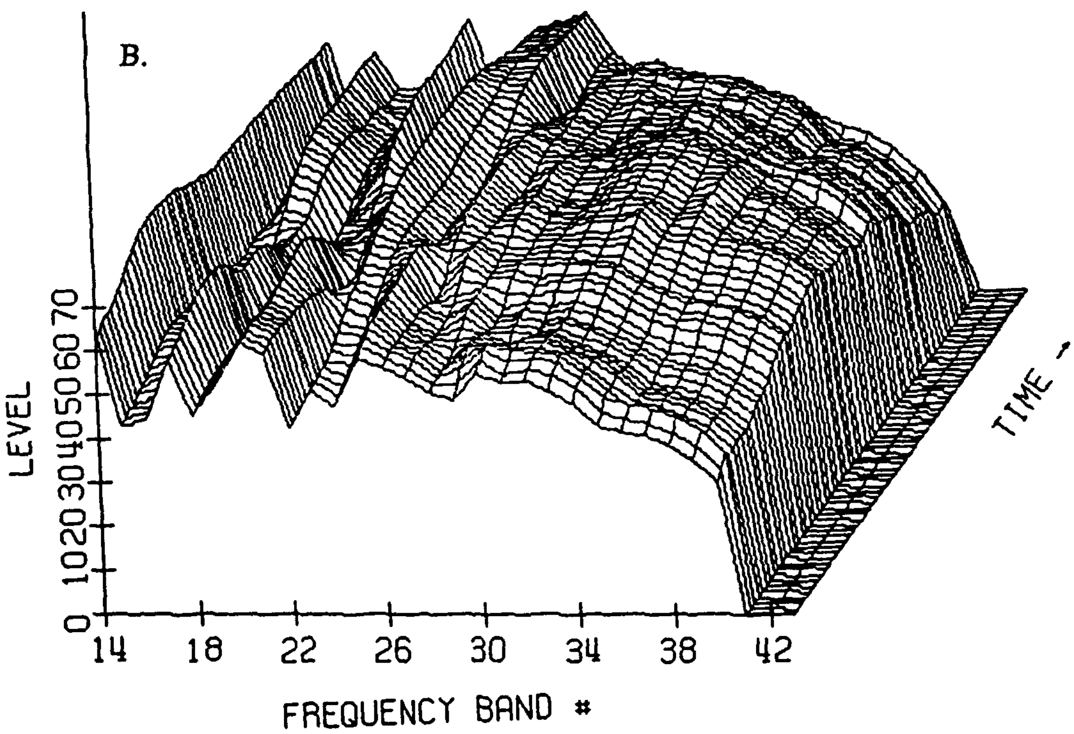
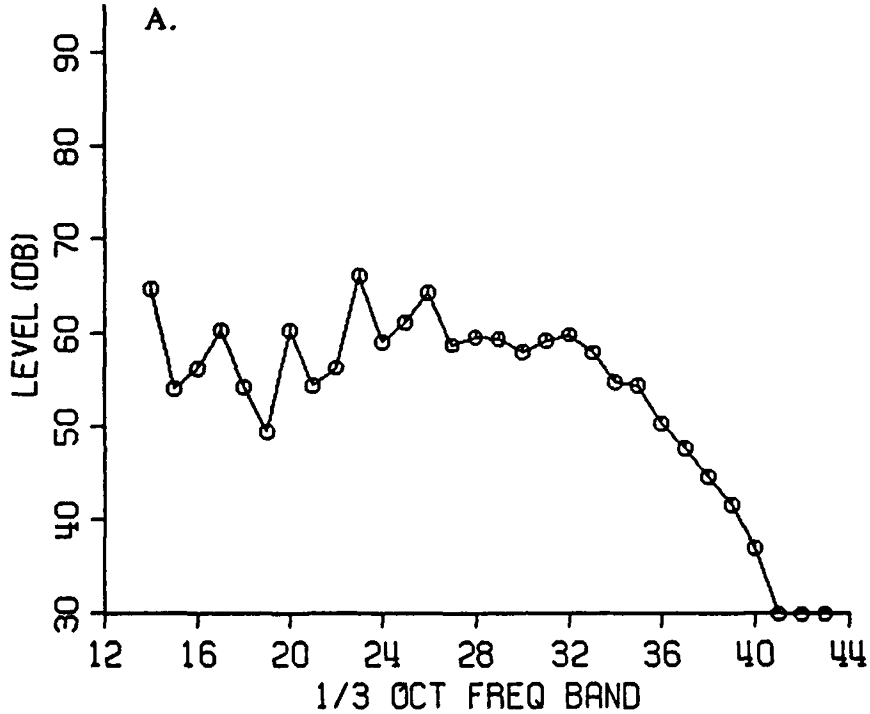


FIGURE C-E-3-2: EVENT E7 - TAKEOFF - 07/24/91
SCHWEIZER 300 - CONFIGURATION E
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



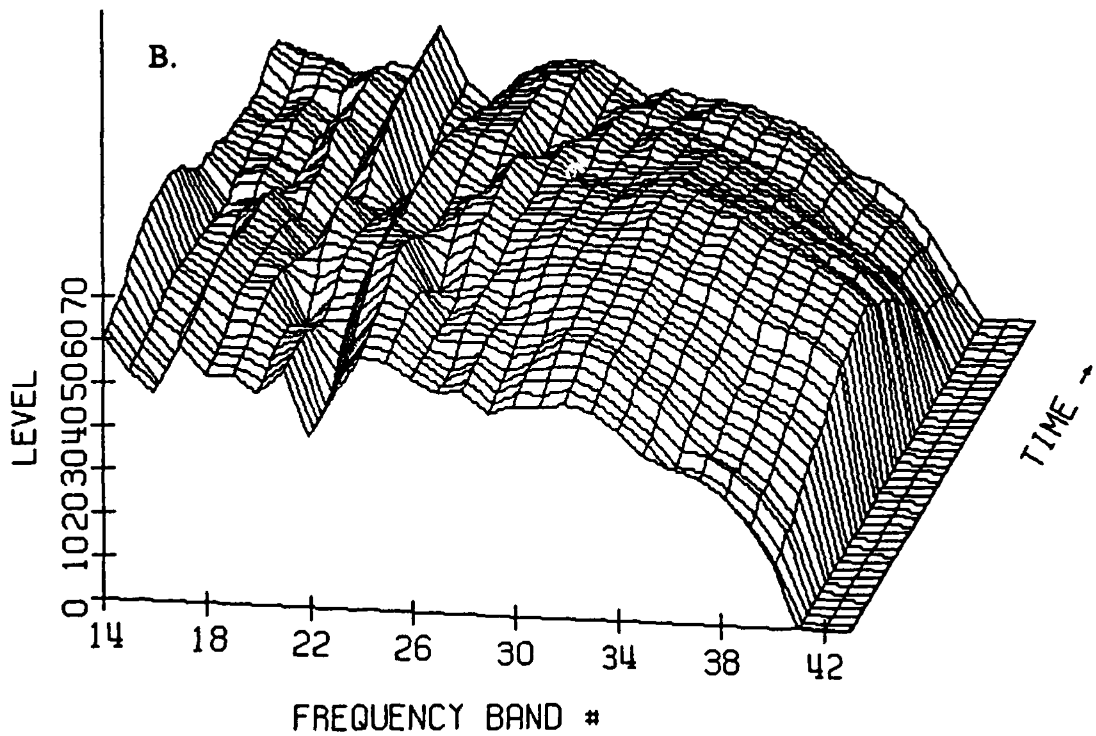
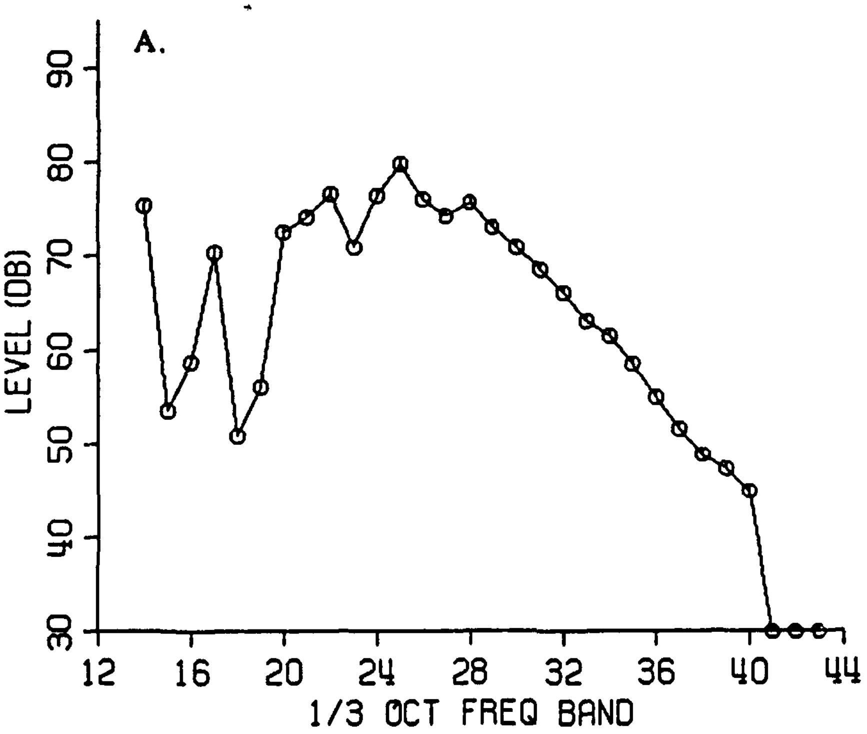


FIGURE C-E-3-3: EVENT A3 - LEVEL FLYOVER - 07/24/91
SCHWEIZER 300 - CONFIGURATION E
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



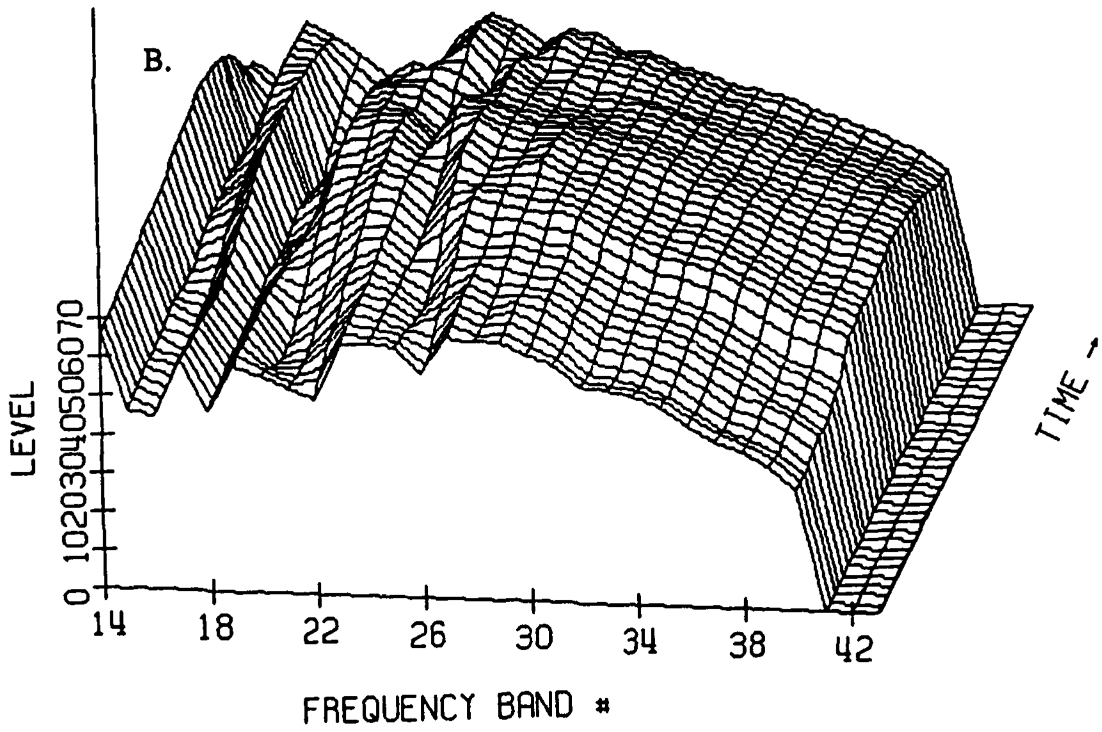
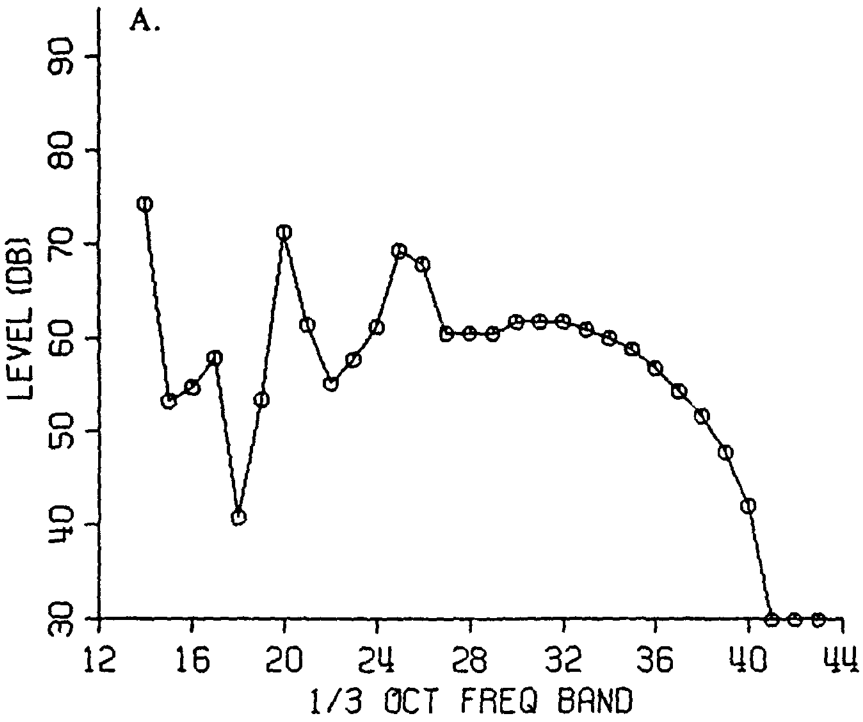


FIGURE C-F-1-1: EVENT B22 - APPROACH - 07/25/91
SCHWEIZER 300 - CONFIGURATION F
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



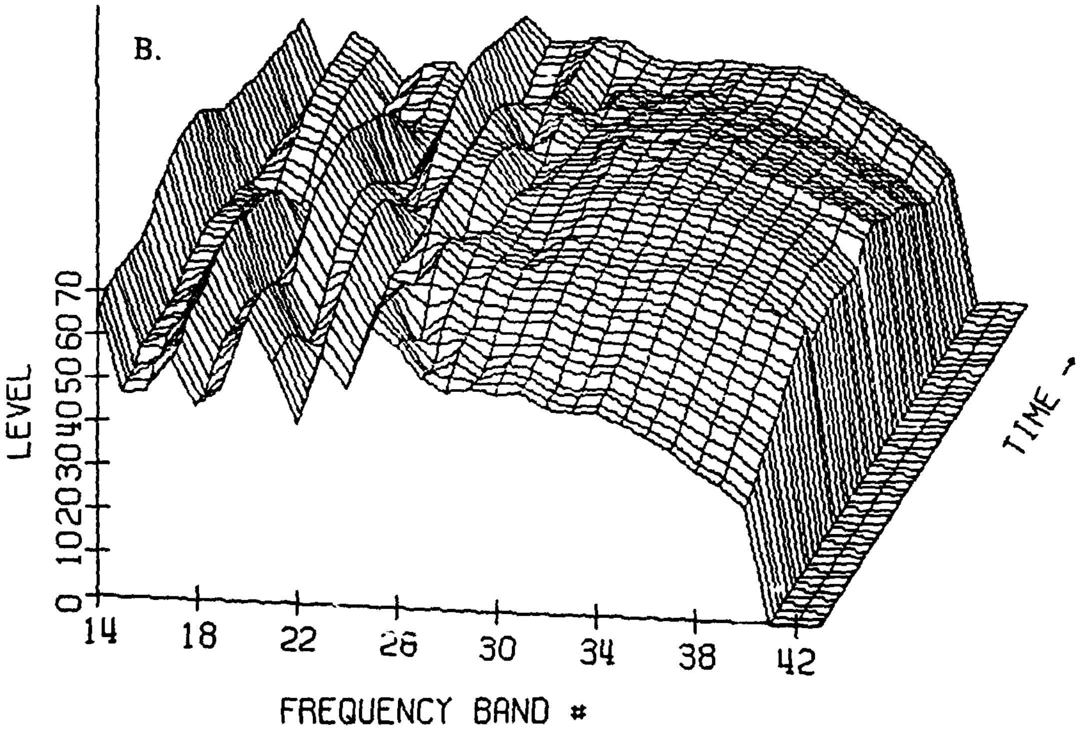


FIGURE C-F-1-2: EVENT C26 - TAKEOFF - 07/25/91
SCHWEIZER 300 - CONFIGURATION F
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

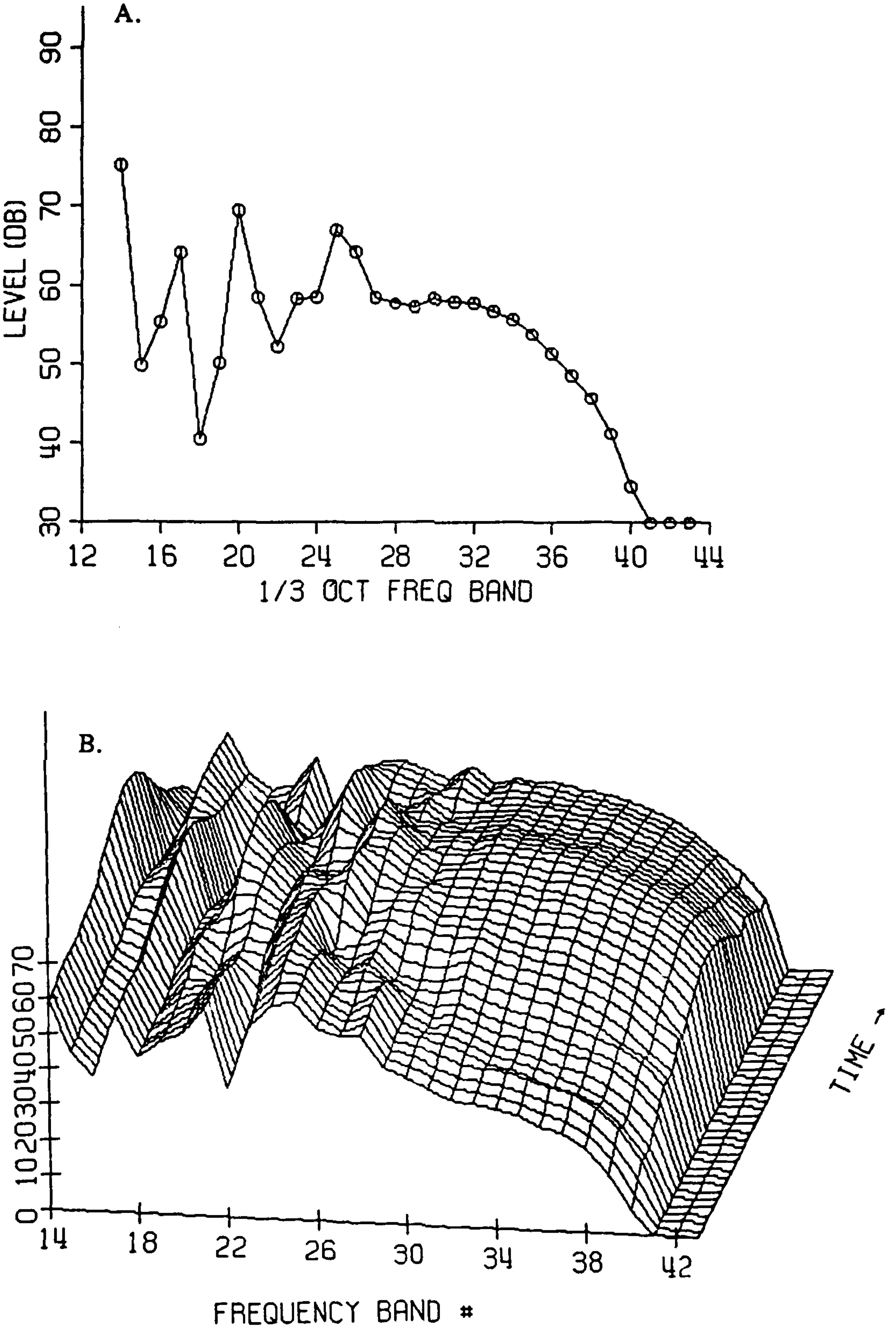
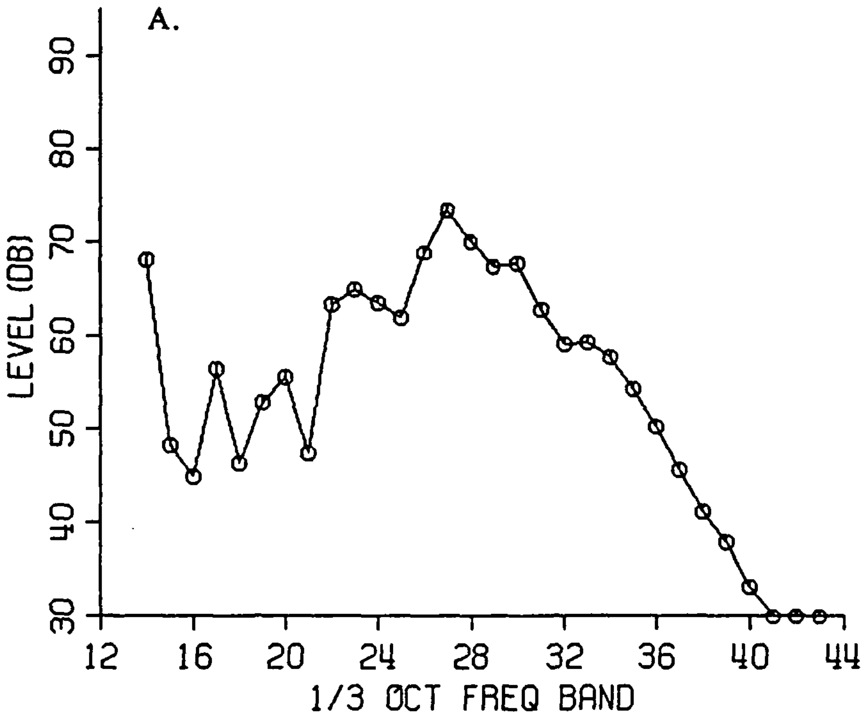


FIGURE C-F-1-3: EVENT A3 - LEVEL FLYOVER - 07/25/91
SCHWEIZER 300 - CONFIGURATION F
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



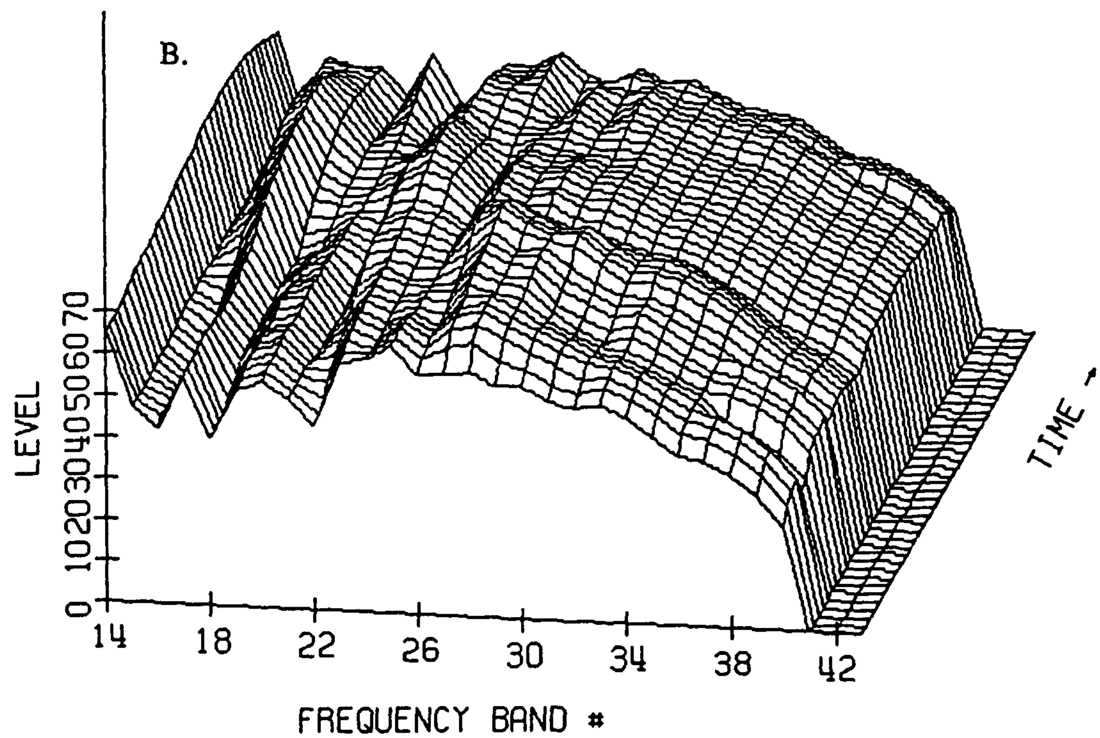


FIGURE C-F-2-1: EVENT B22 - APPROACH - 07/25/91
SCHWEIZER 300 - CONFIGURATION F
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

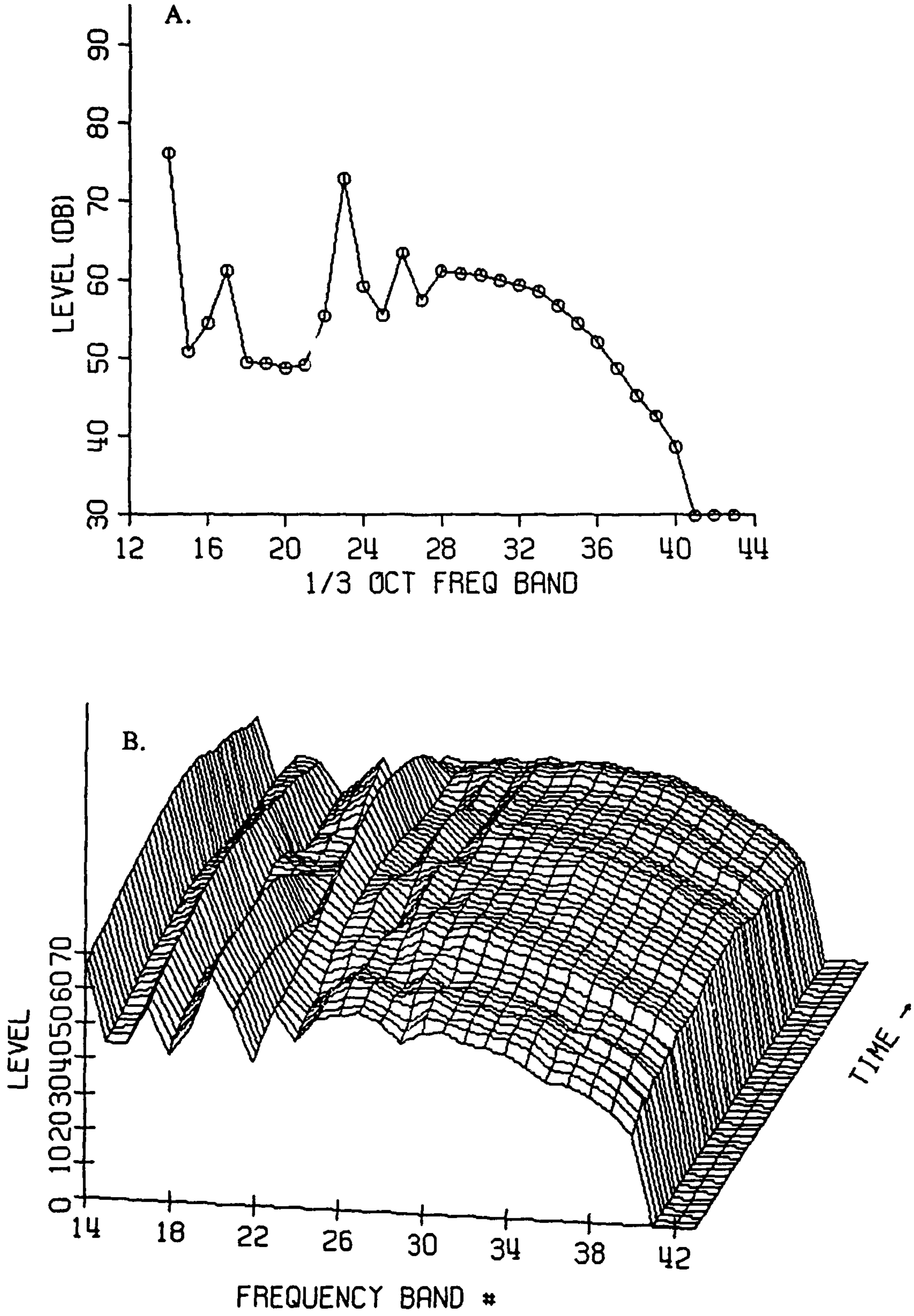
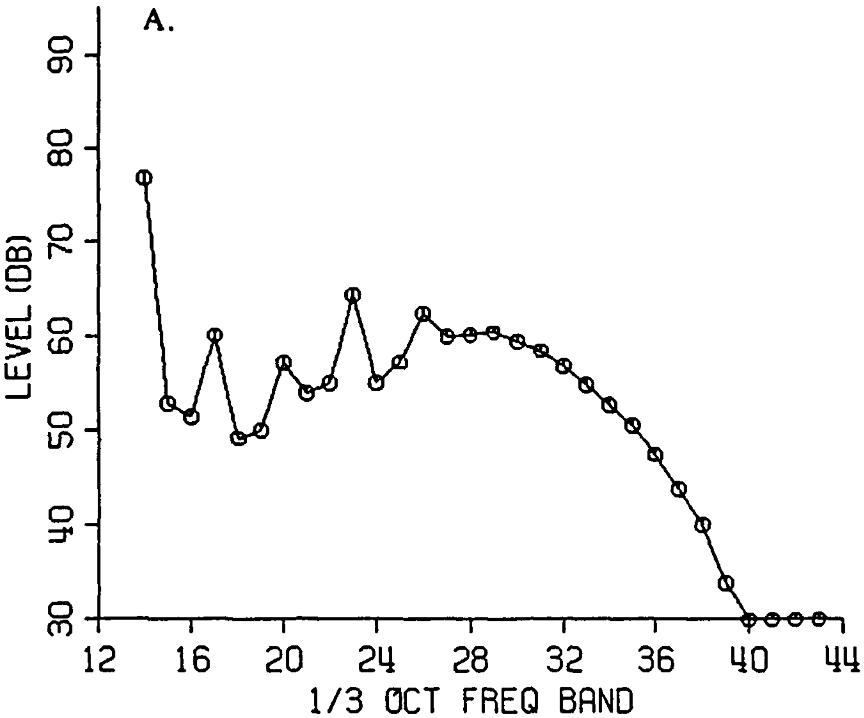


FIGURE C-F-2-2: EVENT C26 - TAKEOFF - 07/25/91
SCHWEIZER 300 - CONFIGURATION F
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



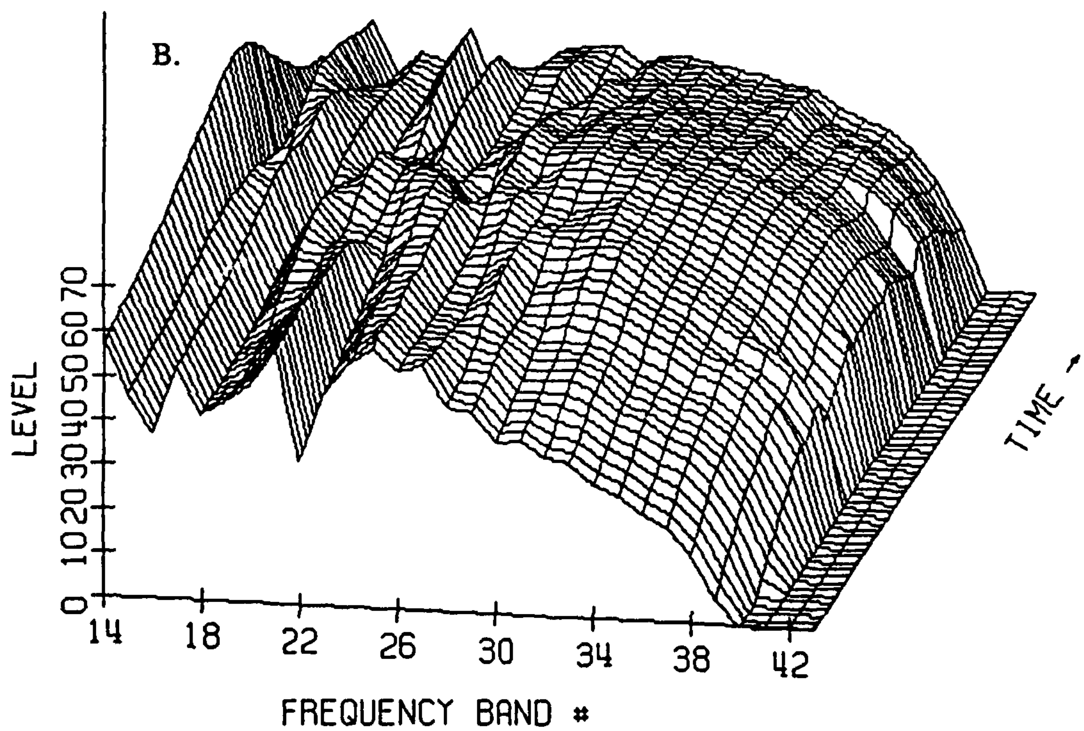
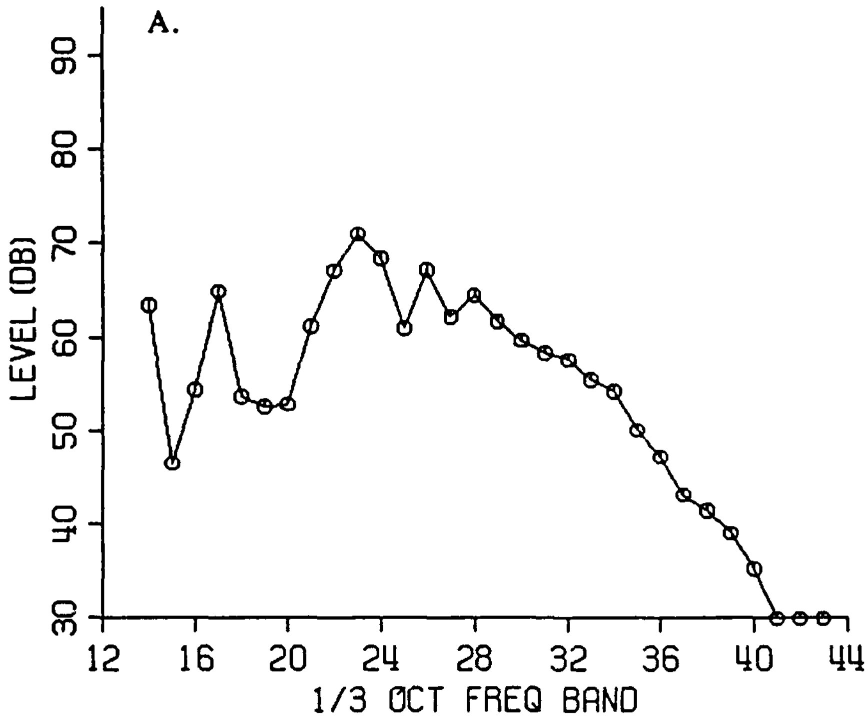


FIGURE C-F-2-3: EVENT A3 - LEVEL FLYOVER - 07/25/91
SCHWEIZER 300 - CONFIGURATION F
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



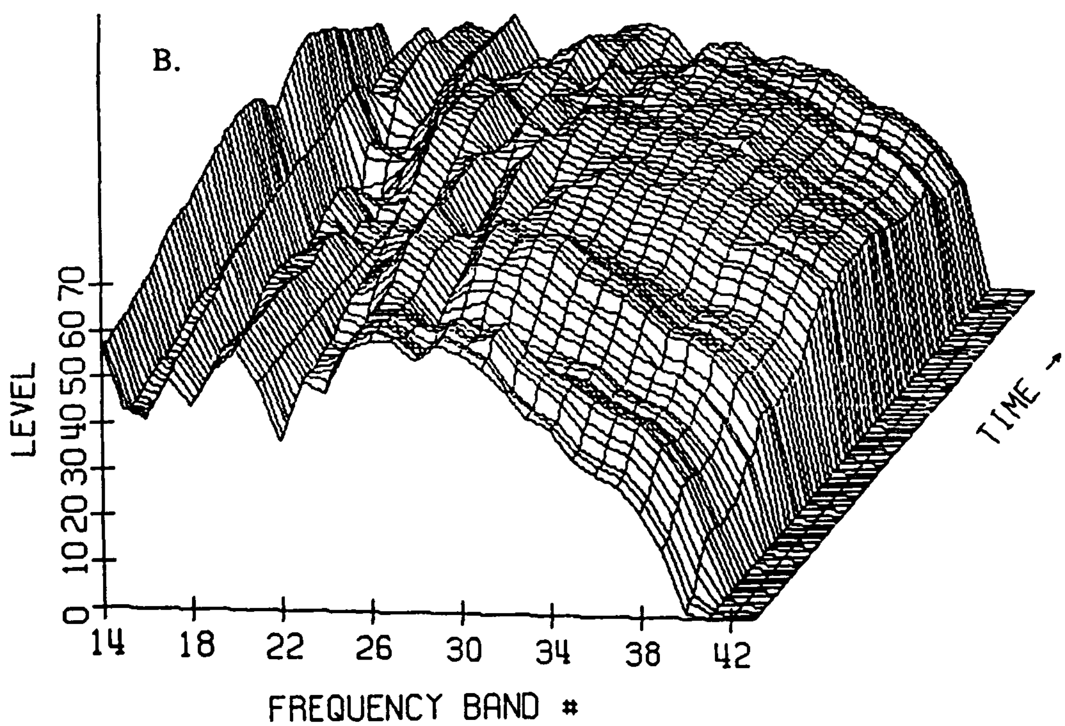


FIGURE C-F-3-1: EVENT B22 - APPROACH - 07/25/91
SCHWEIZER 300 - CONFIGURATION F
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

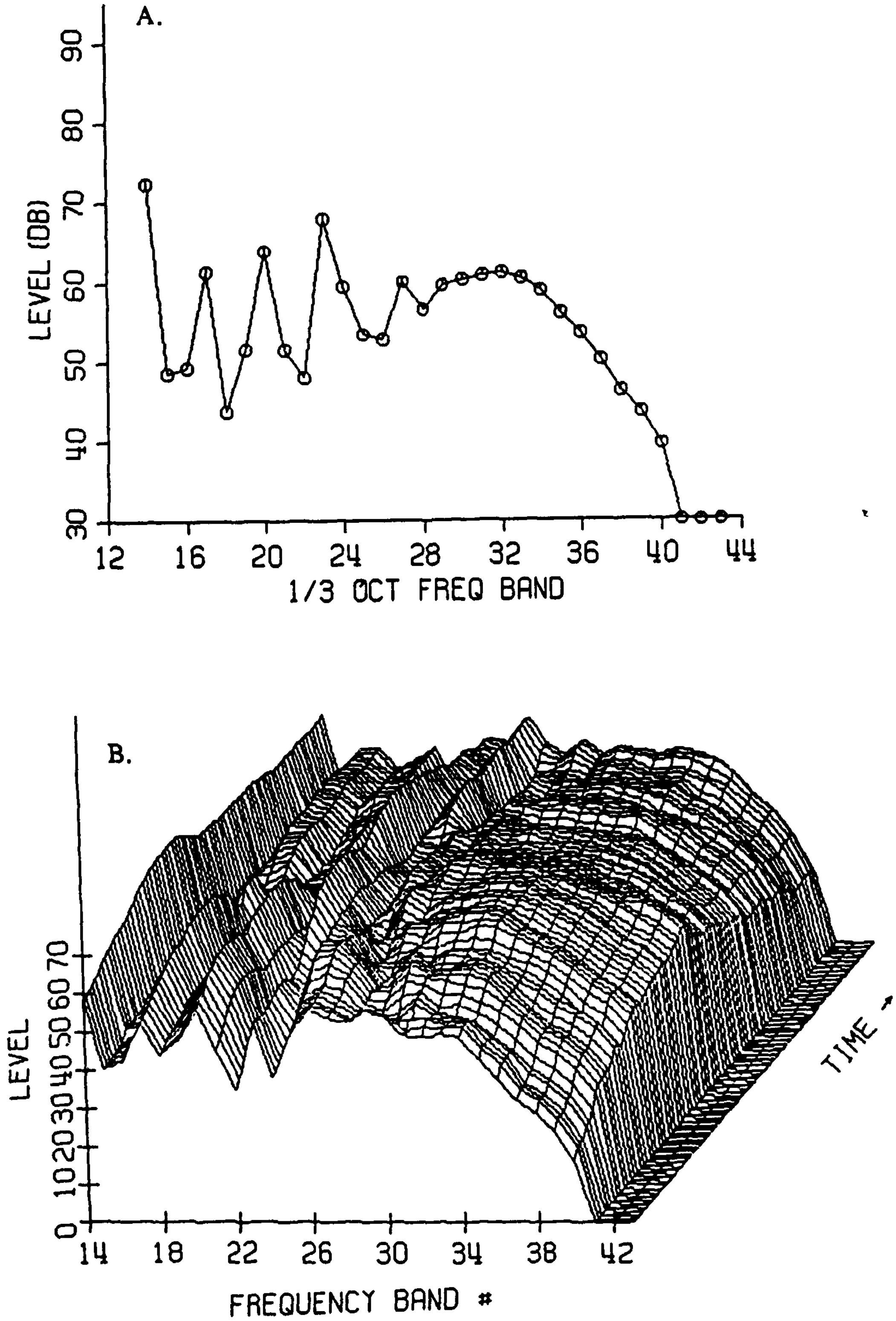
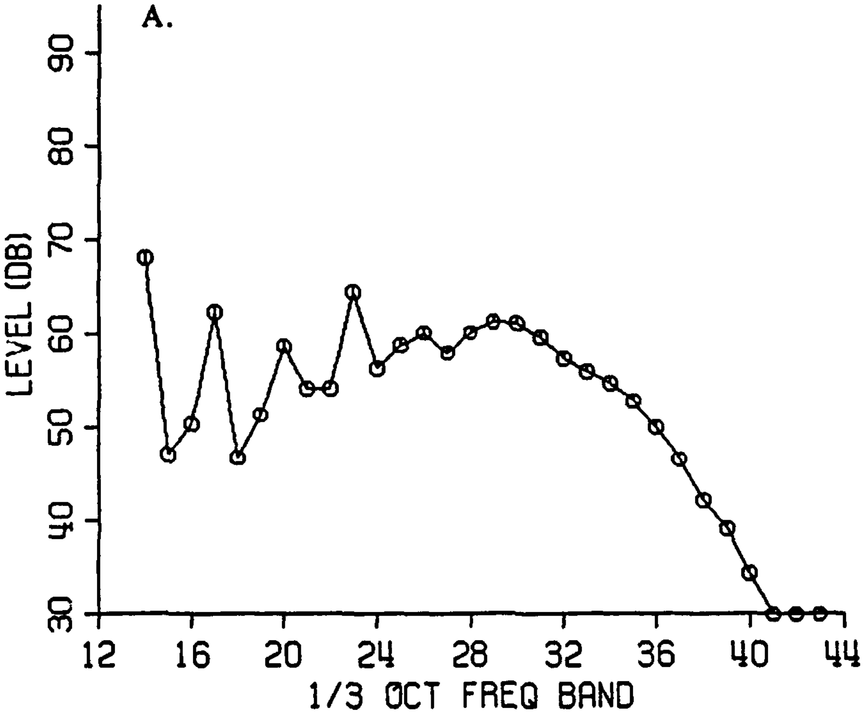


FIGURE C-F-3-2: EVENT C26 - TAKEOFF - 07/25/91
SCHWEIZER 300 - CONFIGURATION F
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



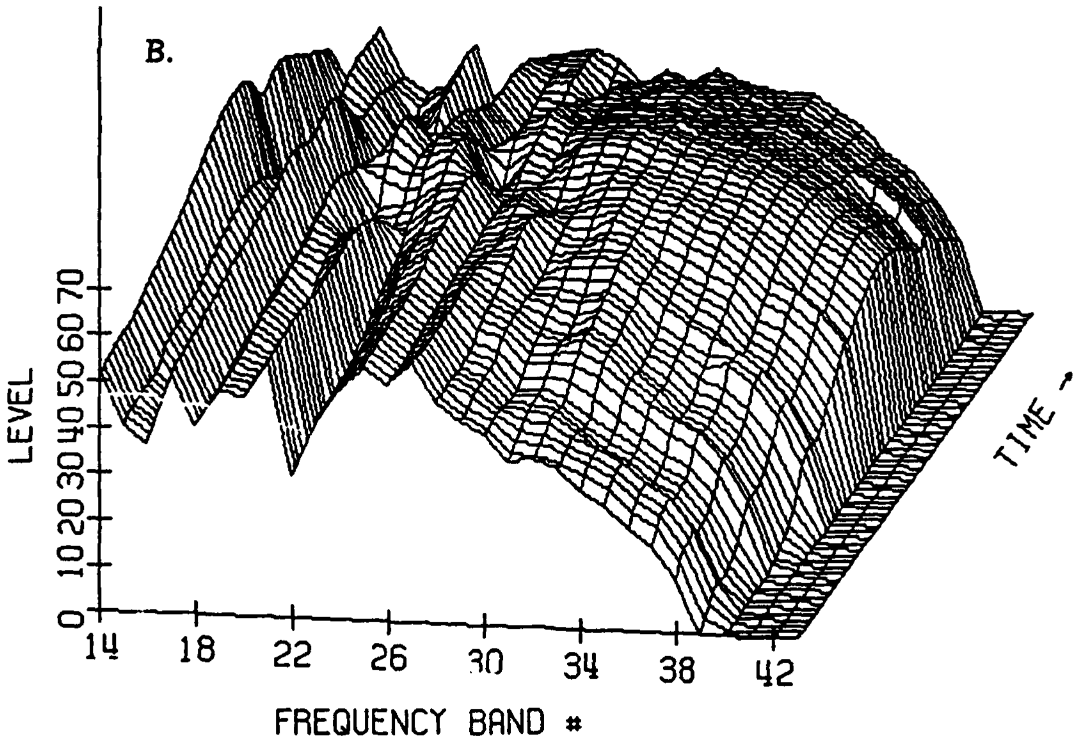
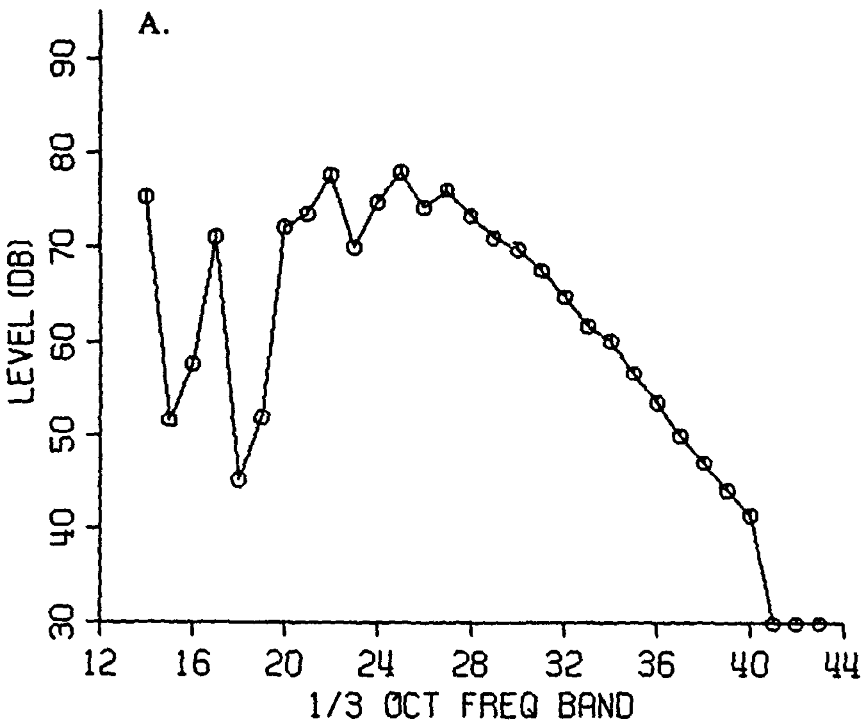


FIGURE C-F-3-3: EVENT A3 - LEVEL FLYOVER - 07/25/91
SCHWEIZER 300 - CONFIGURATION F
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



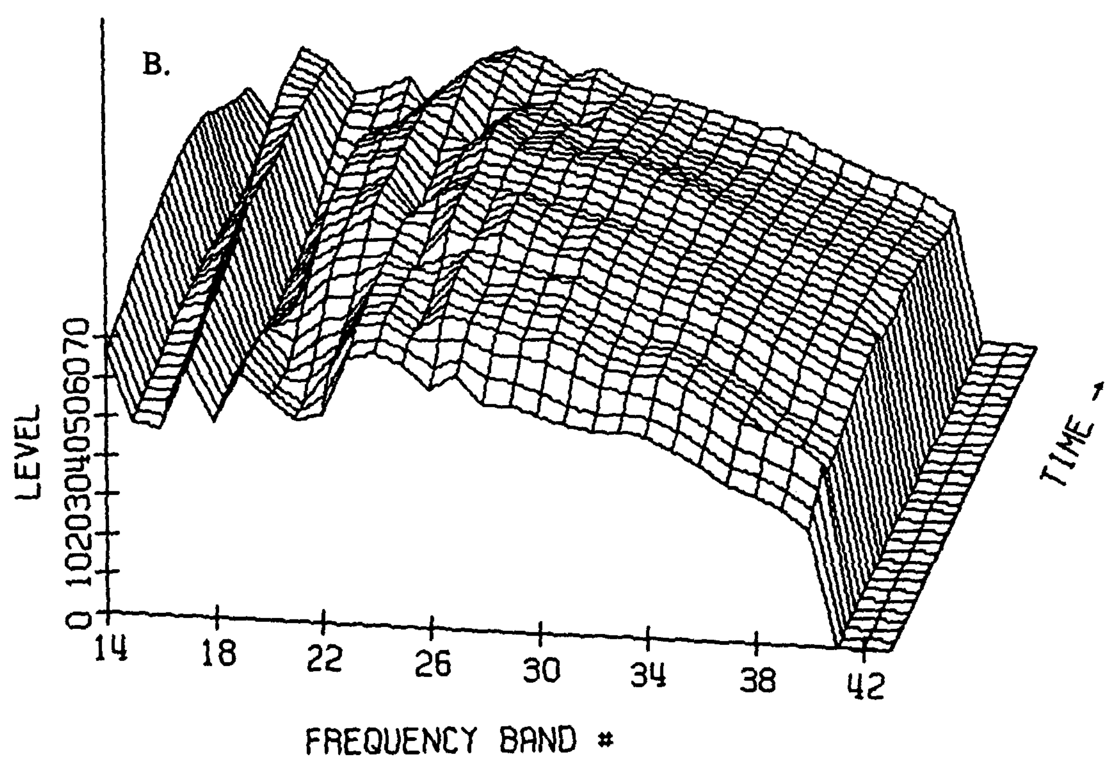
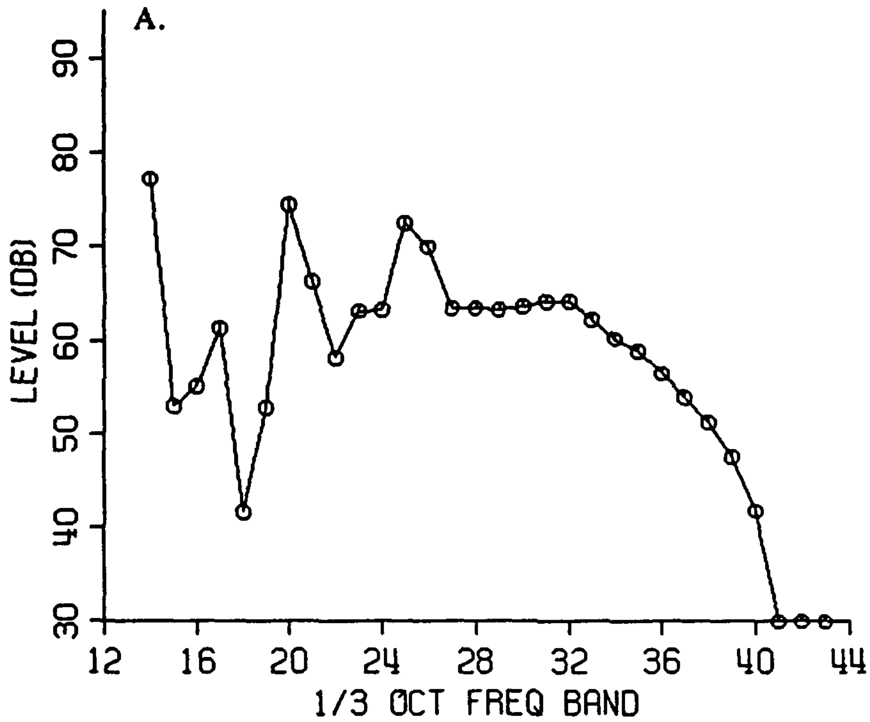


FIGURE C-G-1-1: EVENT B16 - APPROACH - 07/25/91
SCHWEIZER 300 - CONFIGURATION G
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



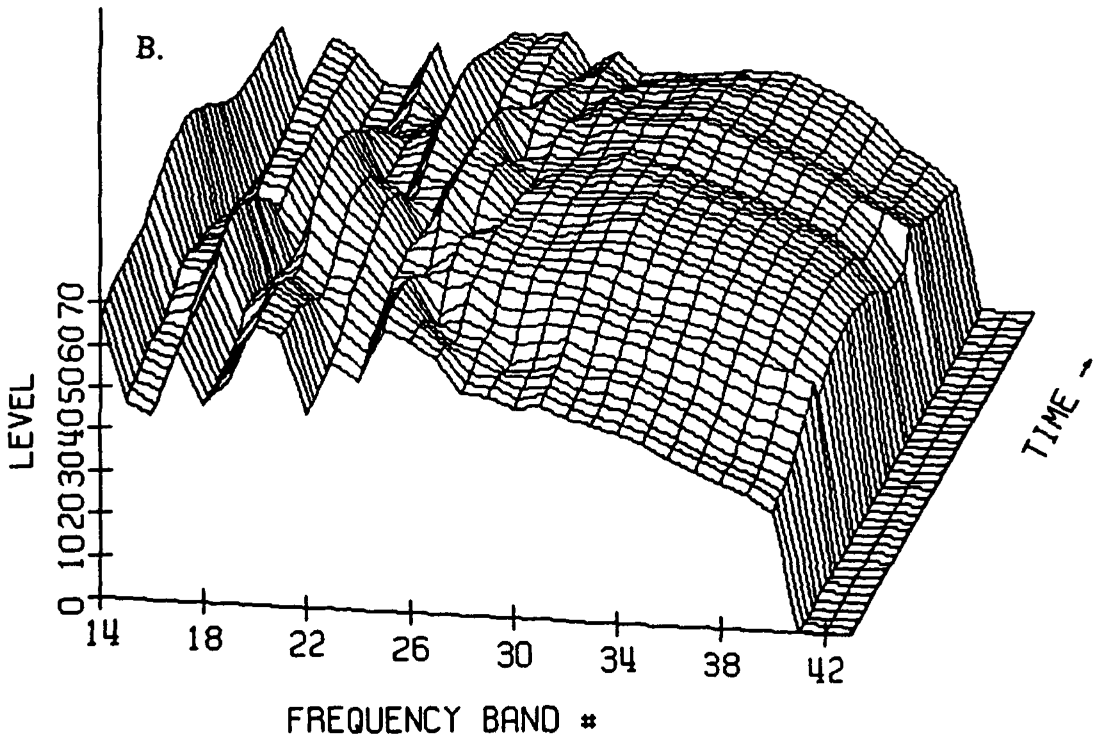
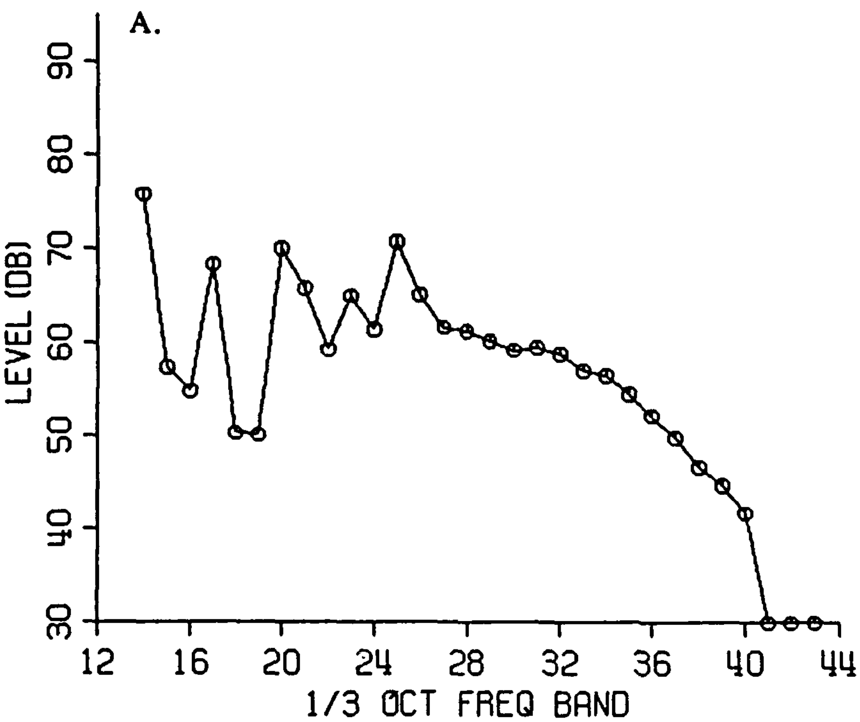


FIGURE C-G-1-2: EVENT C25 - TAKEOFF - 07/25/91
SCHWEIZER 300 - CONFIGURATION G
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



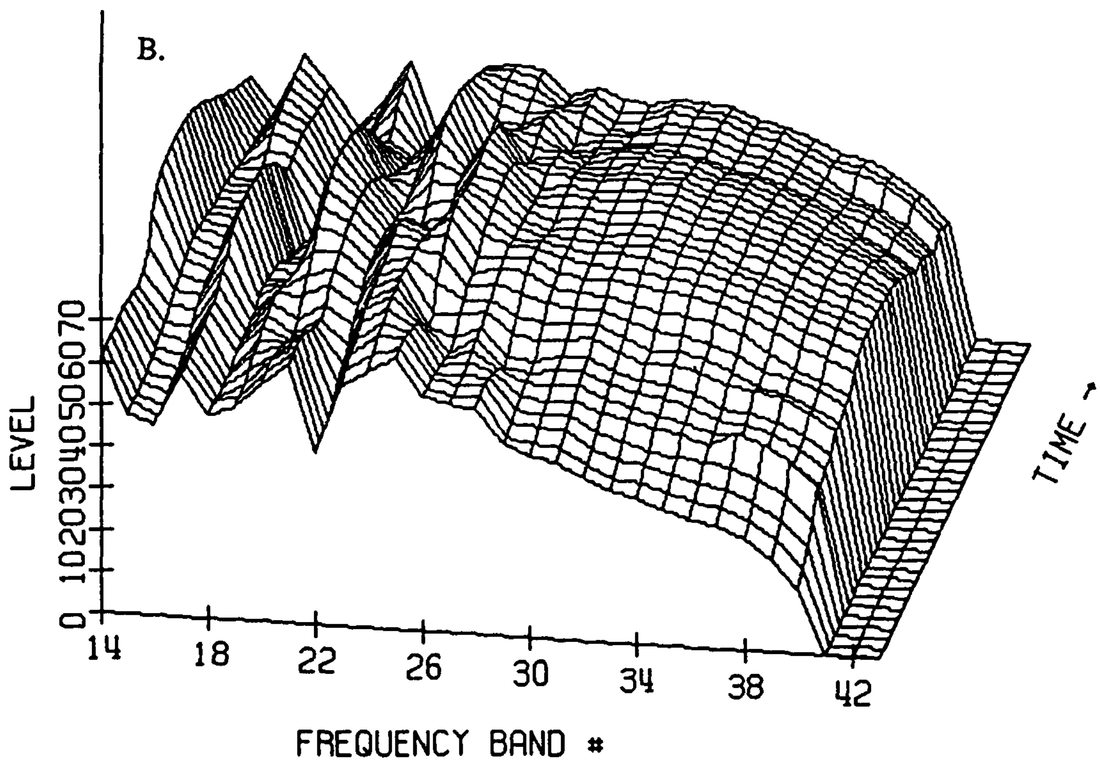
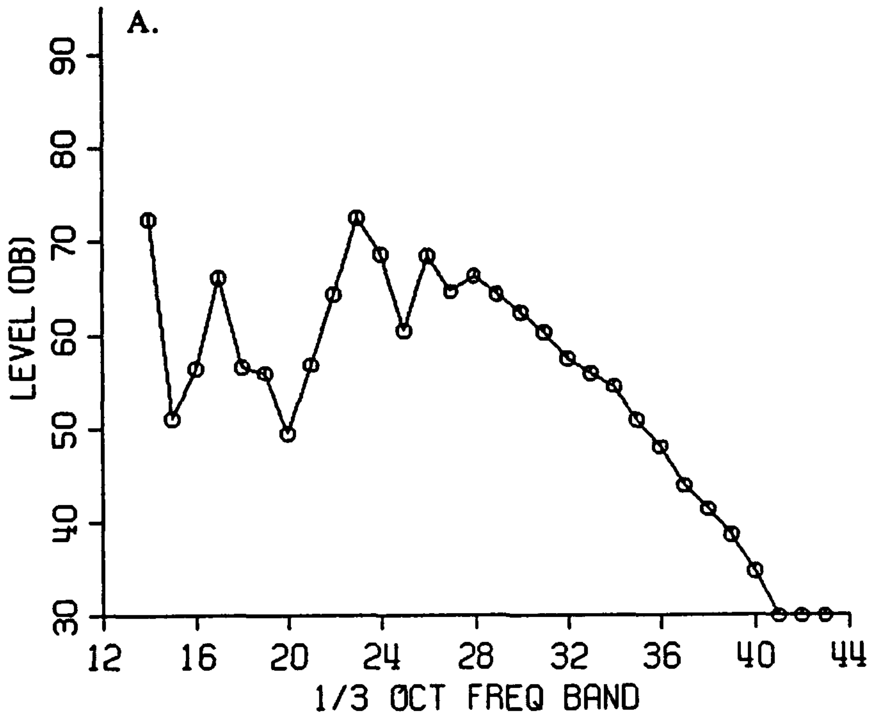


FIGURE C-G-1-3: EVENT A5 - LEVEL FLYOVER - 07/25/91
SCHWEIZER 300 - CONFIGURATION G
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



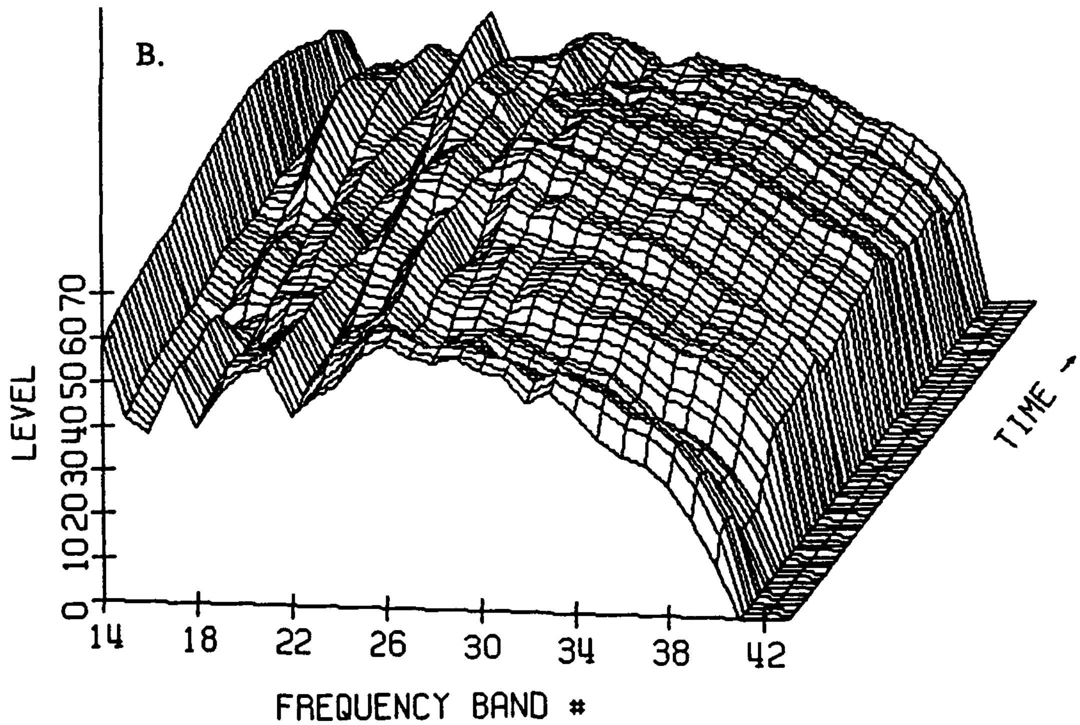
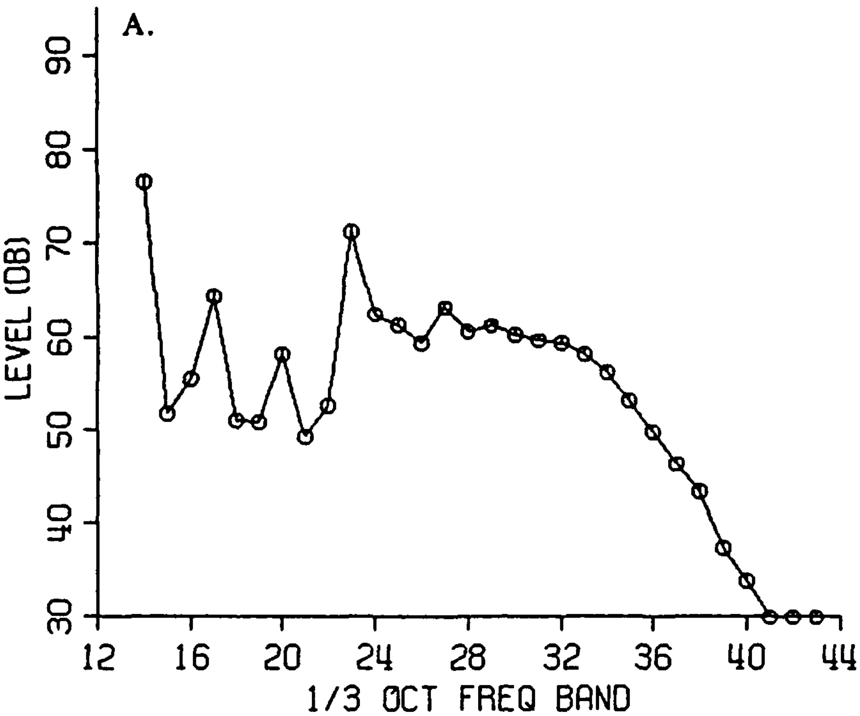


FIGURE C-G-2-1: EVENT B16 - APPROACH - 07/25/91
SCHWEIZER 300 - CONFIGURATION G
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



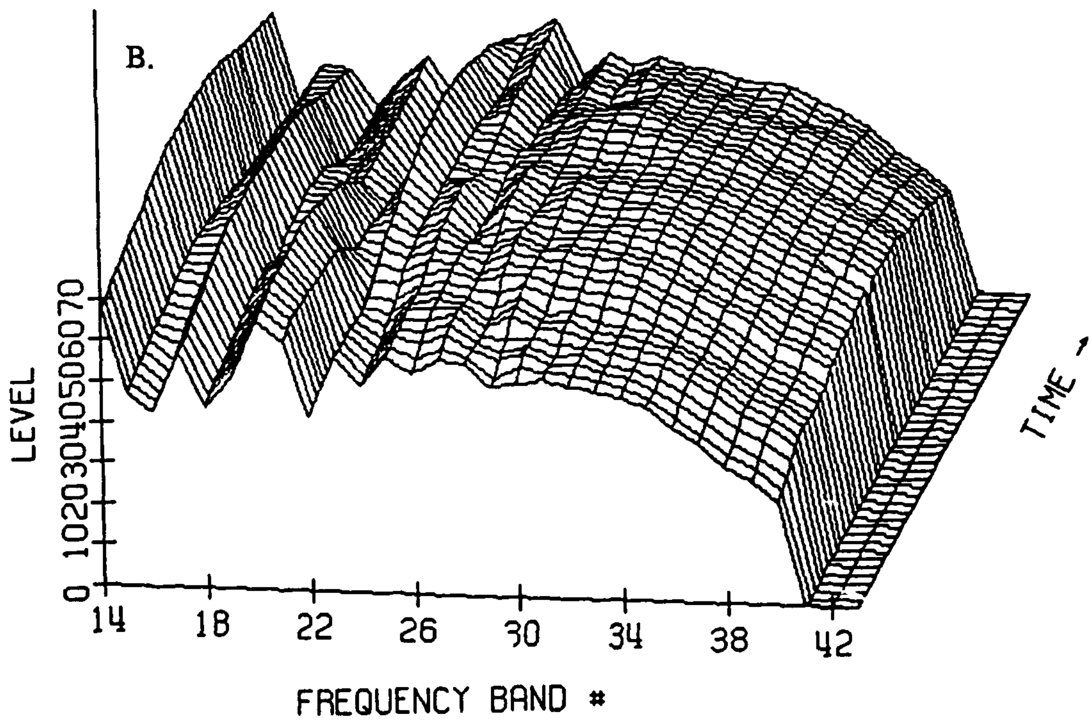
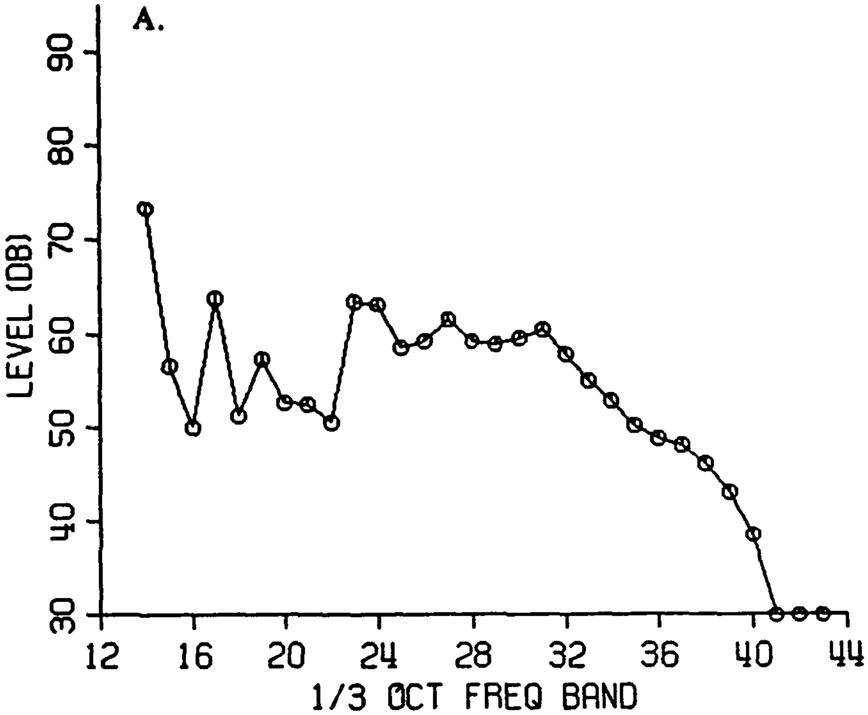


FIGURE C-G-2-2: EVENT C25 - TAKEOFF - 07/25/91
SCHWEIZER 300 - CONFIGURATION G
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



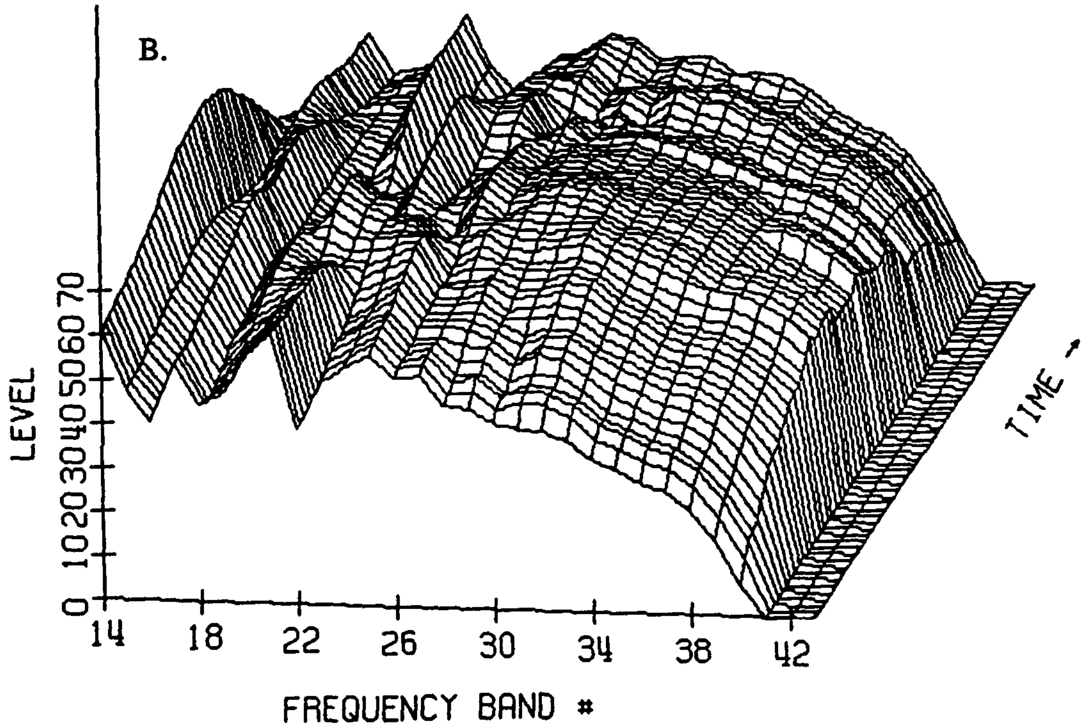
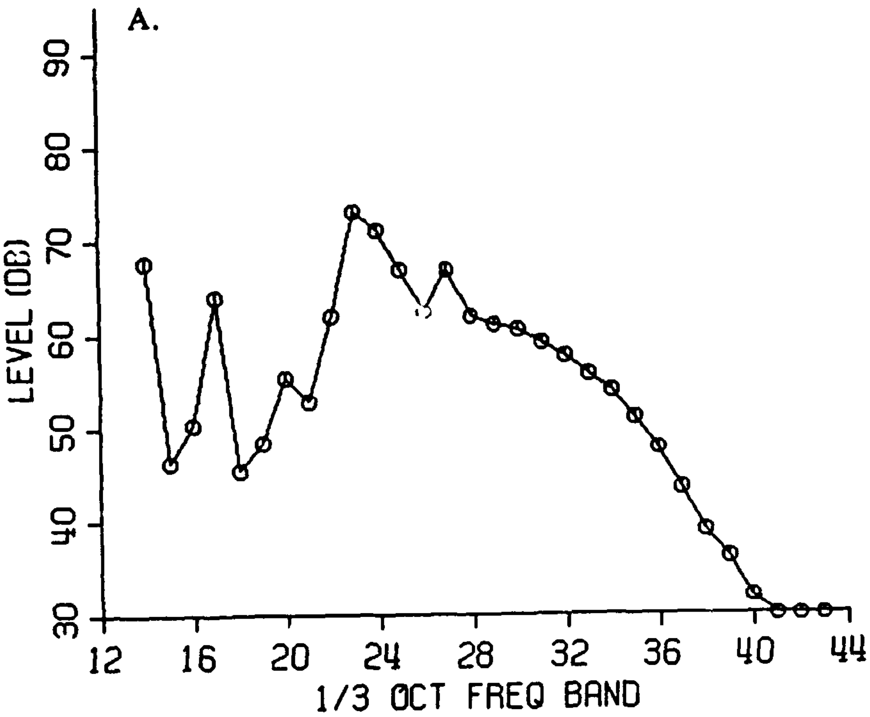


FIGURE C-G-2-3: EVENT A5 - LEVEL FLYOVER - 07/25/91
SCHWEIZER 300 - CONFIGURATION G
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



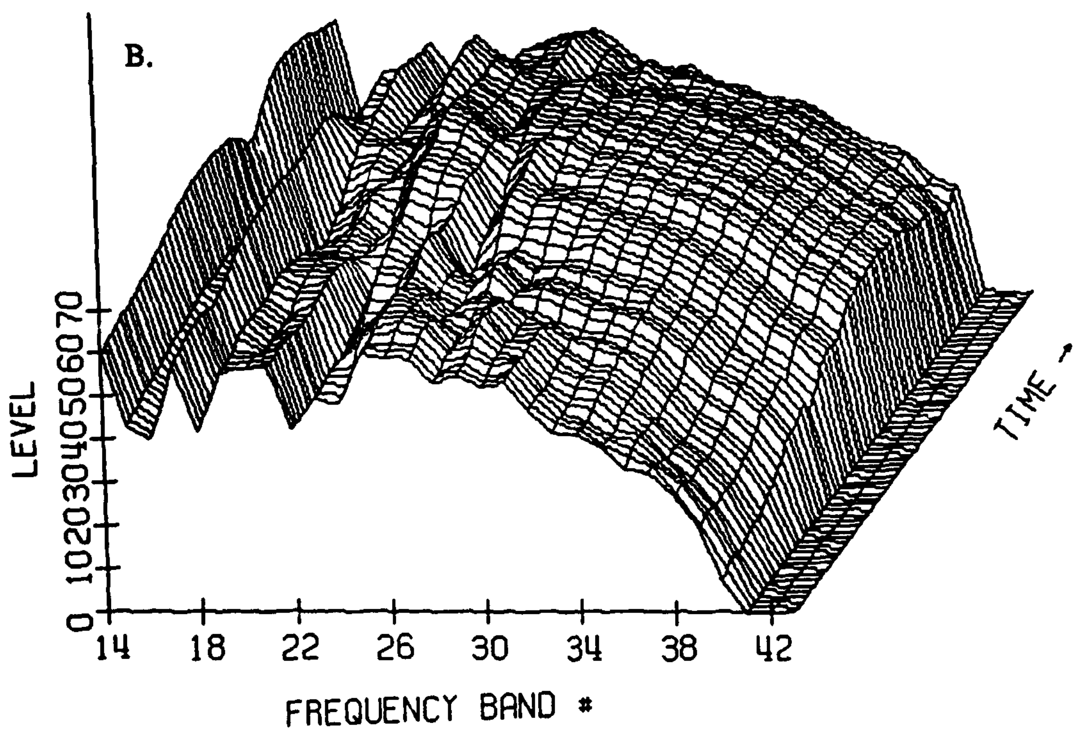
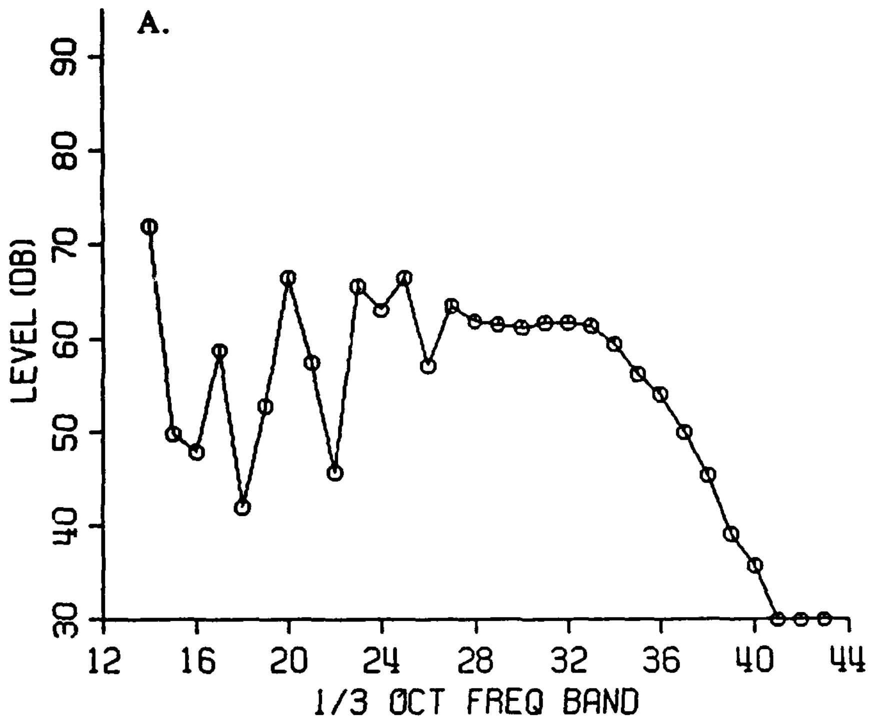


FIGURE C-G-3-1: EVENT B16 - APPROACH - 07/25/91
SCHWEIZER 300 - CONFIGURATION G
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



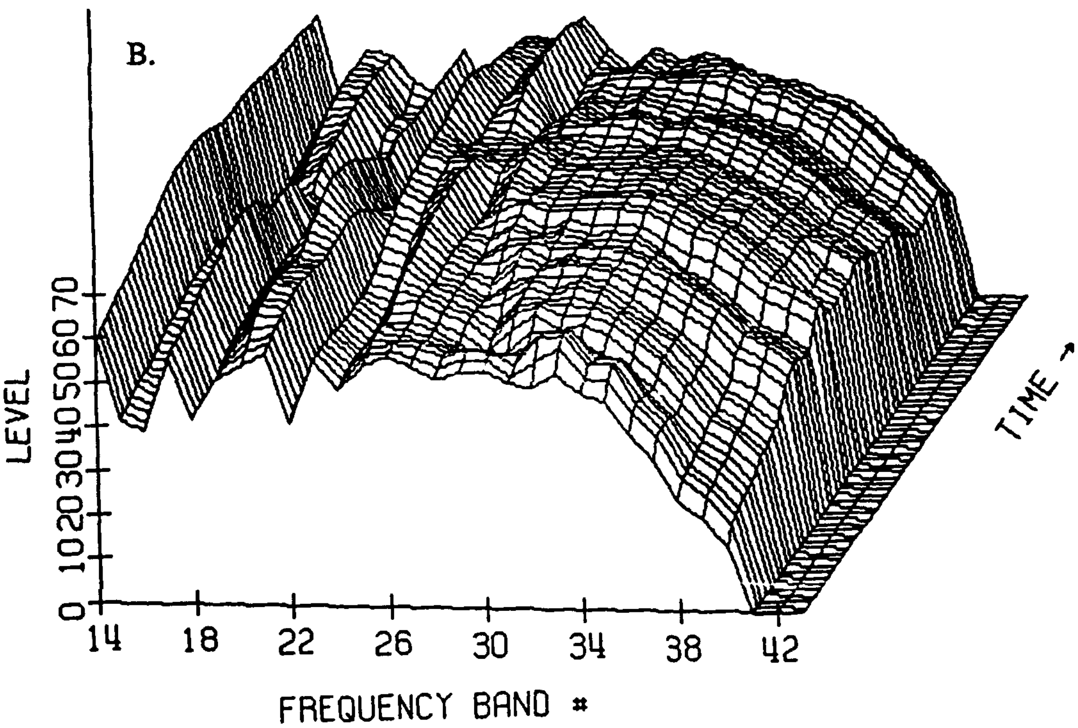
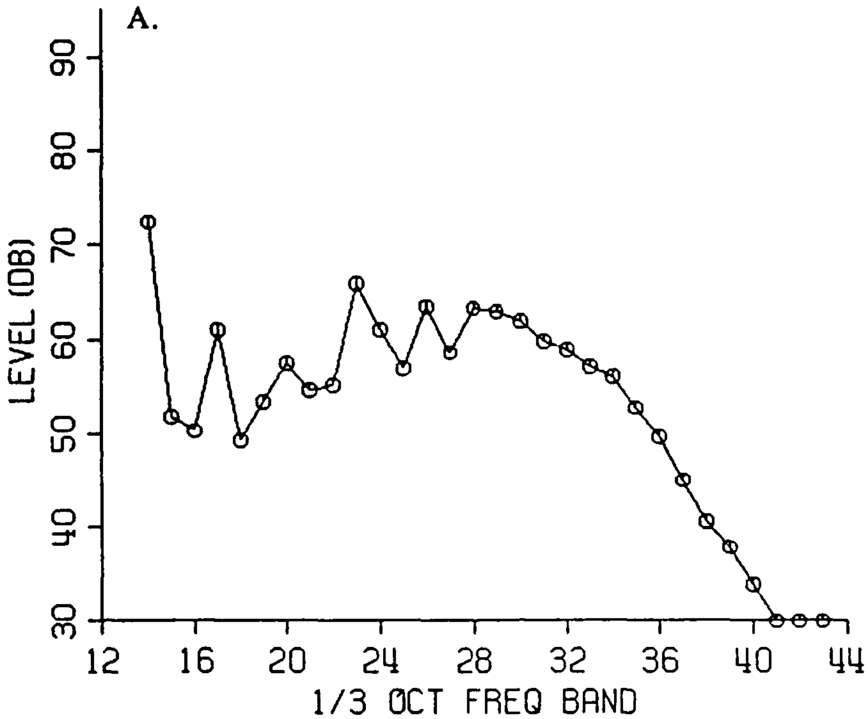


FIGURE C-G-3-2: EVENT C25 - TAKEOFF - 07/25/91
SCHWEIZER 300 - CONFIGURATION G
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



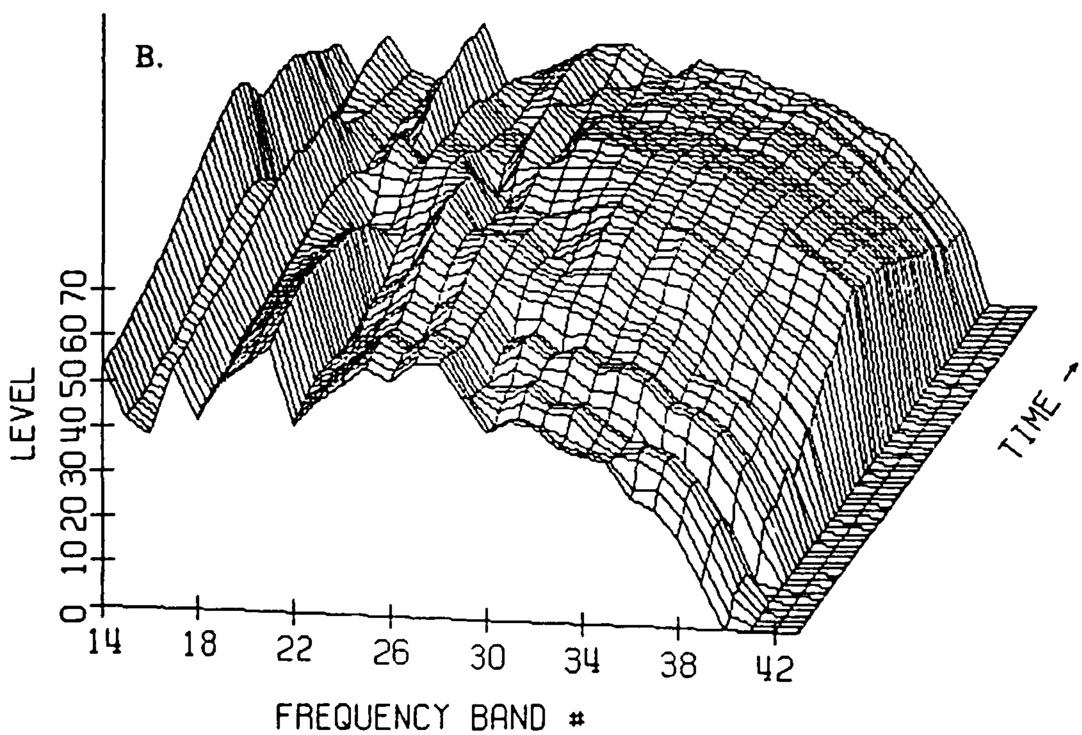
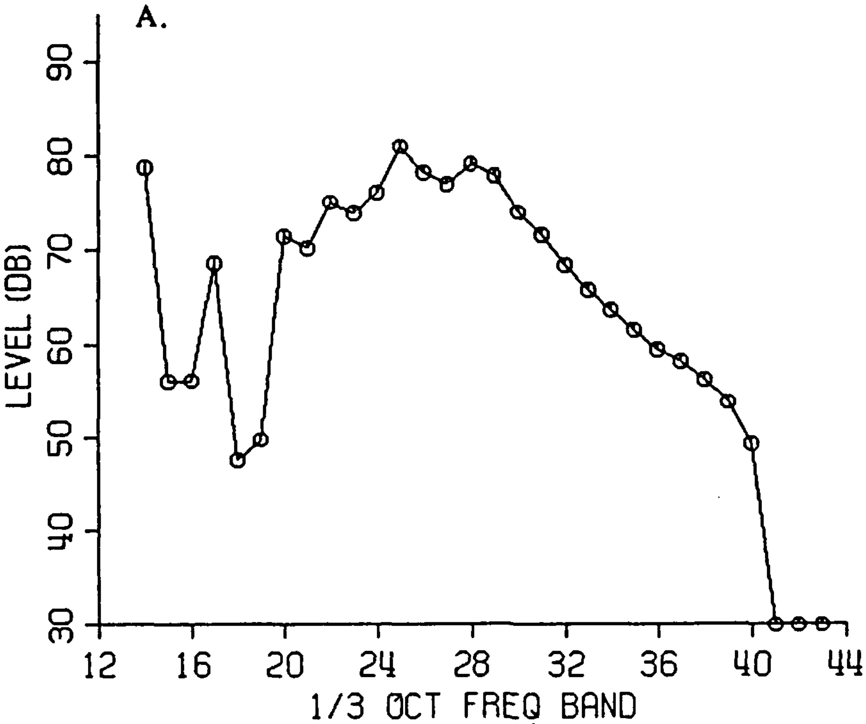


FIGURE C-G-3-3: EVENT A5 - LEVEL FLYOVER - 07/25/91
SCHWEIZER 300 - CONFIGURATION G
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



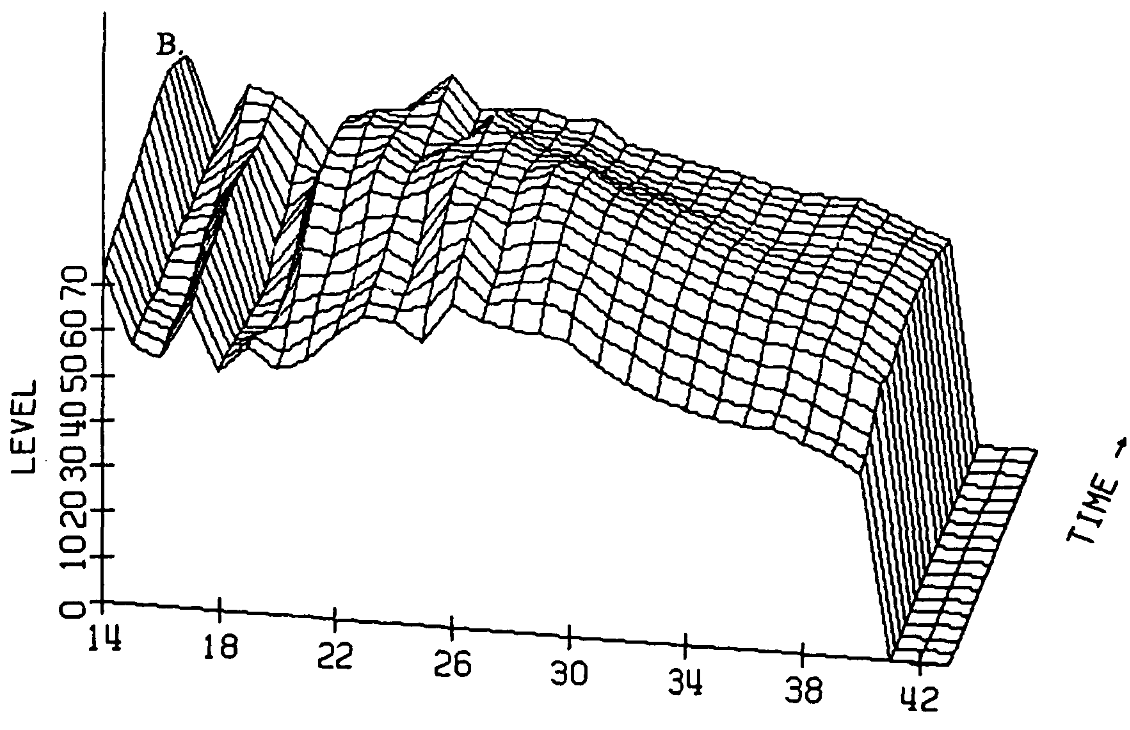
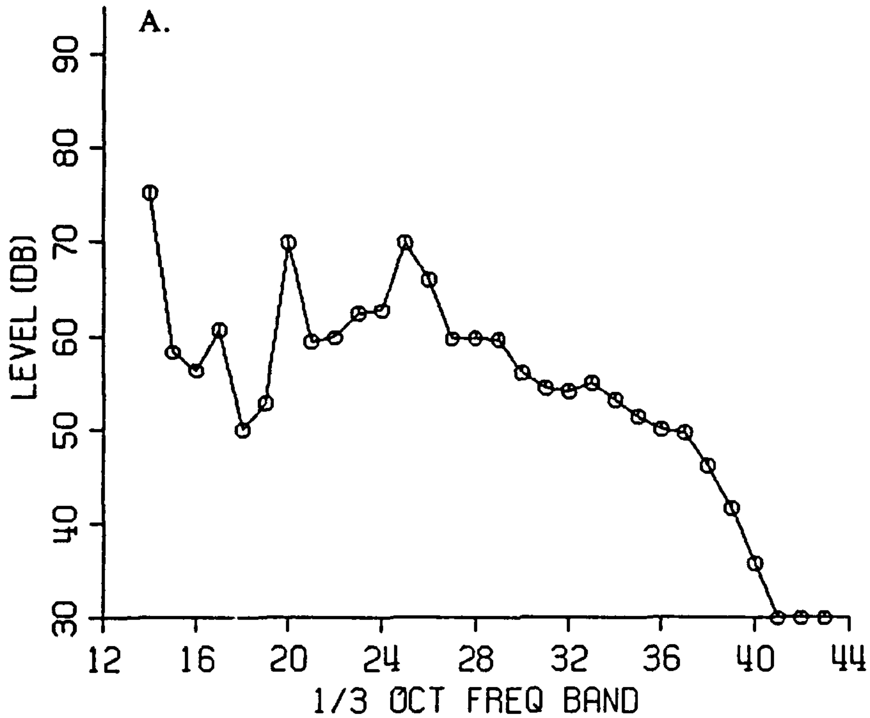


FIGURE C-H-1-1: EVENT B17 - APPROACH - 07/23/91
SCHWEIZER 330 - CONFIGURATION H
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



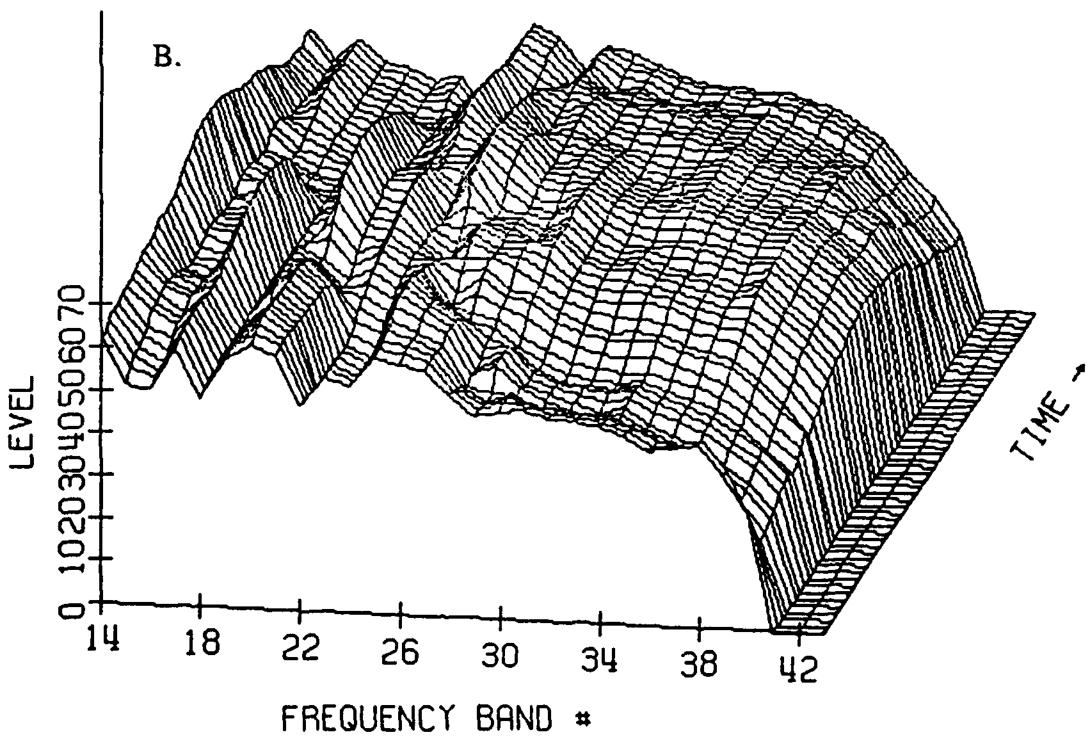
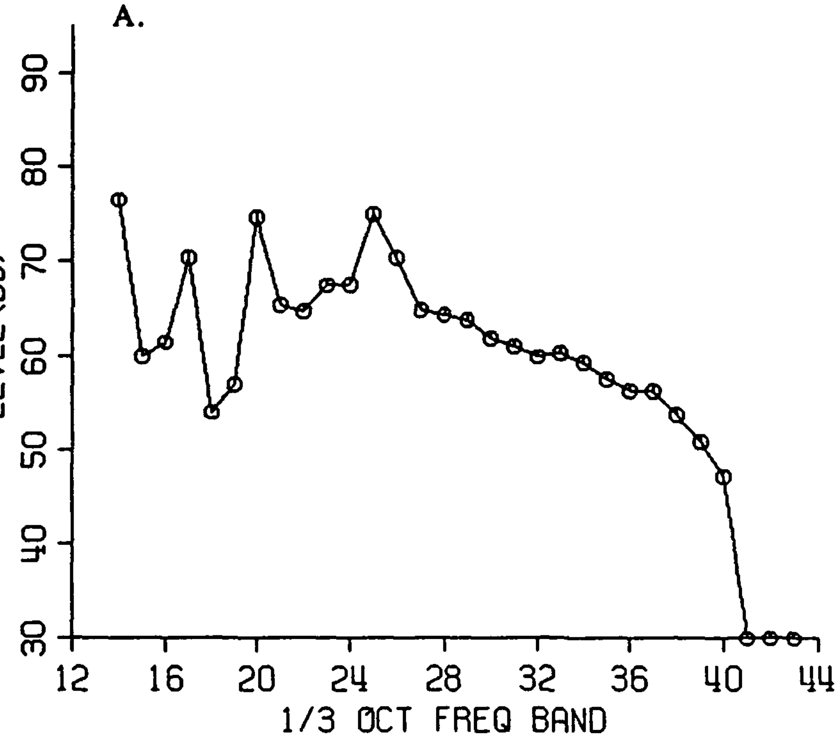


FIGURE C-H-1-2: EVENT C30 - TAKEOFF - 07/23/91
SCHWEIZER 330 - CONFIGURATION H
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



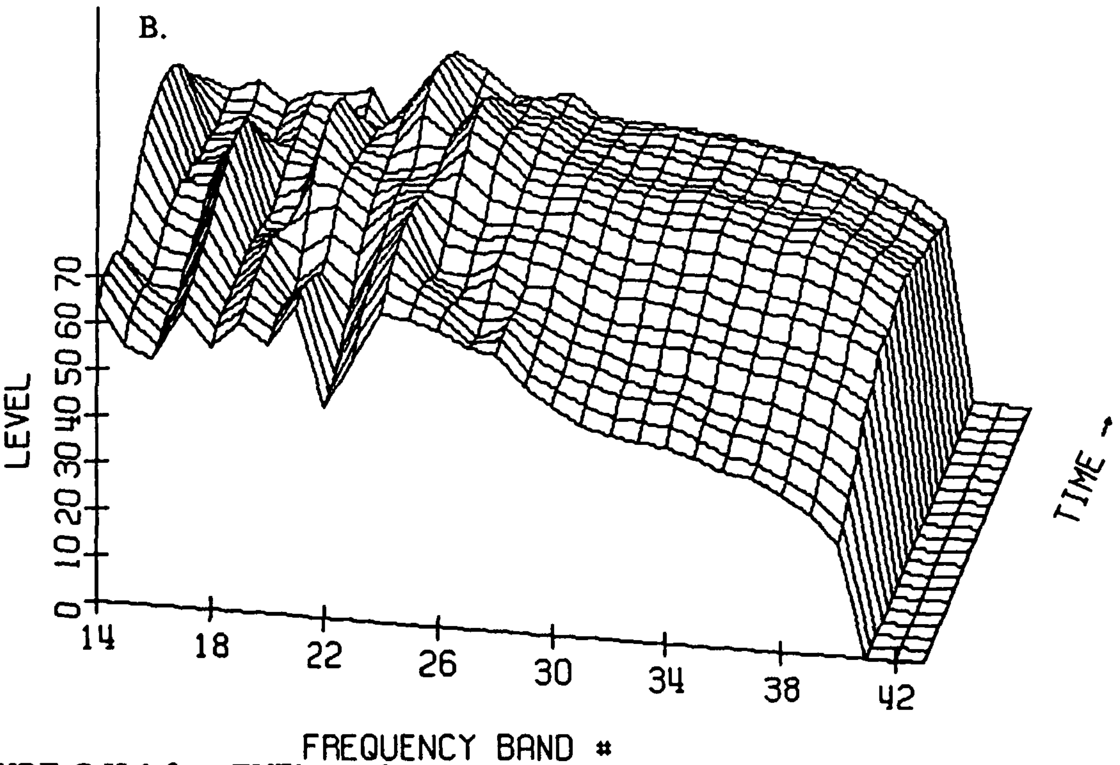
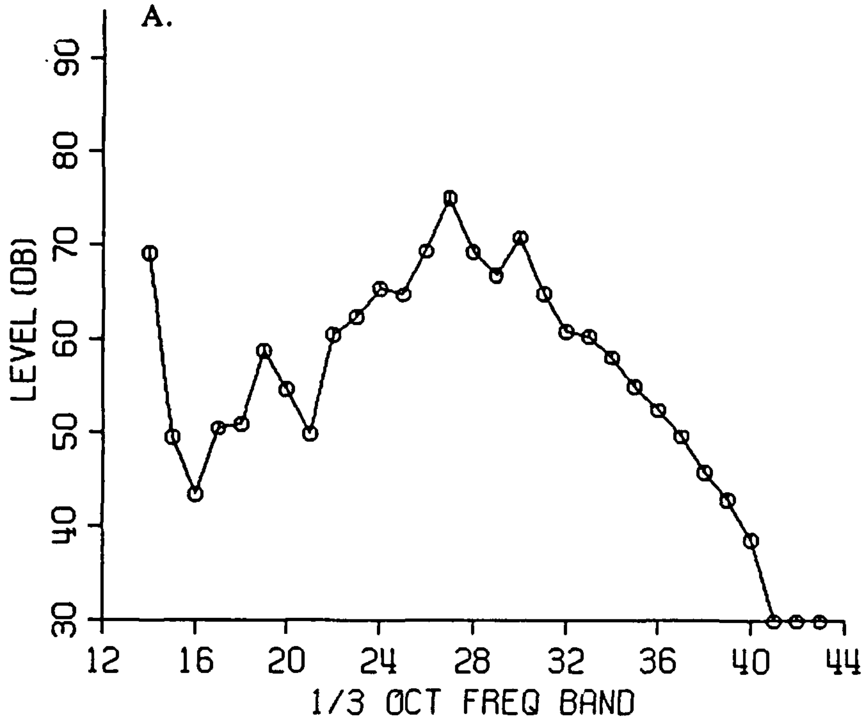


FIGURE C-H-1-3: EVENT A6 - LEVEL FLYOVER - 07/23/91
SCHWEIZER 330 - CONFIGURATION H
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



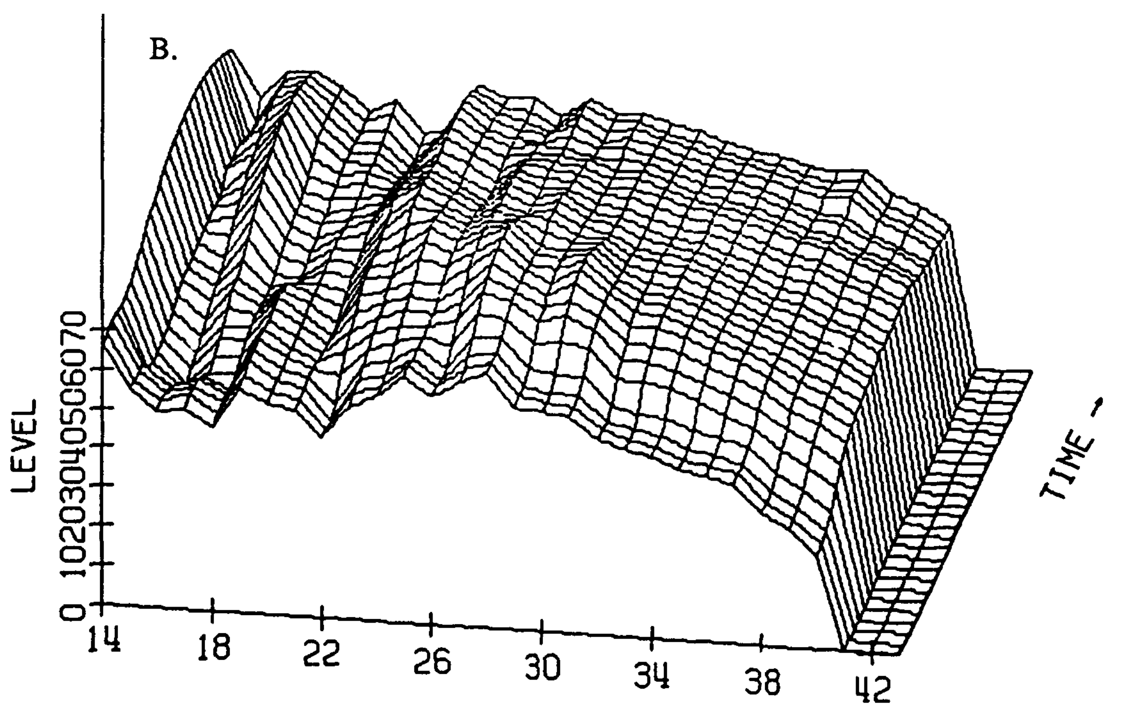
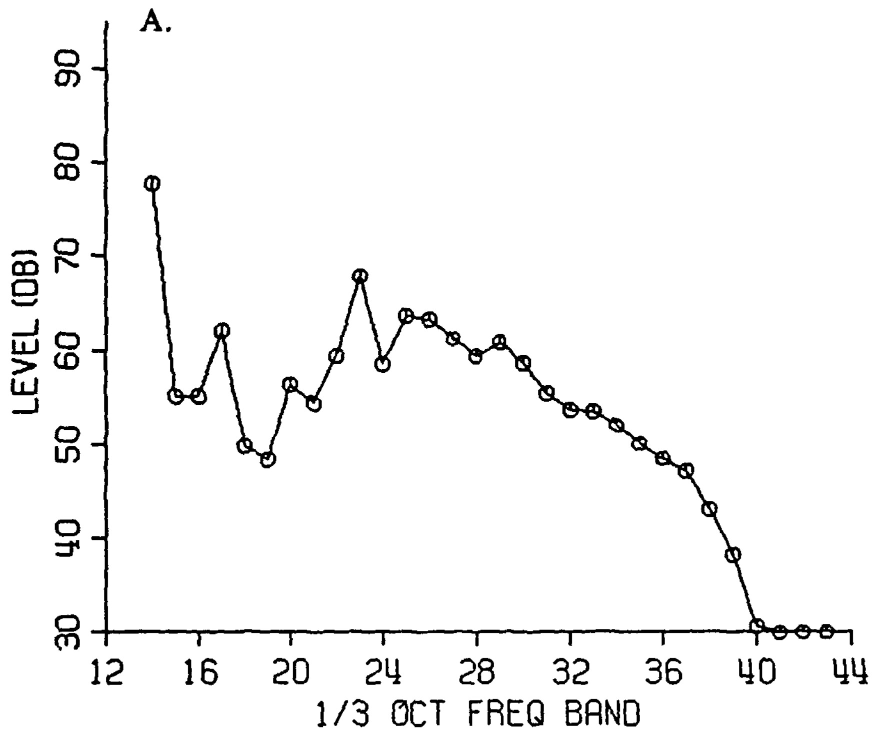


FIGURE C-H-2-1: EVENT B17 - APPROACH - 07/23/91
SCHWEIZER 330 - CONFIGURATION H
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



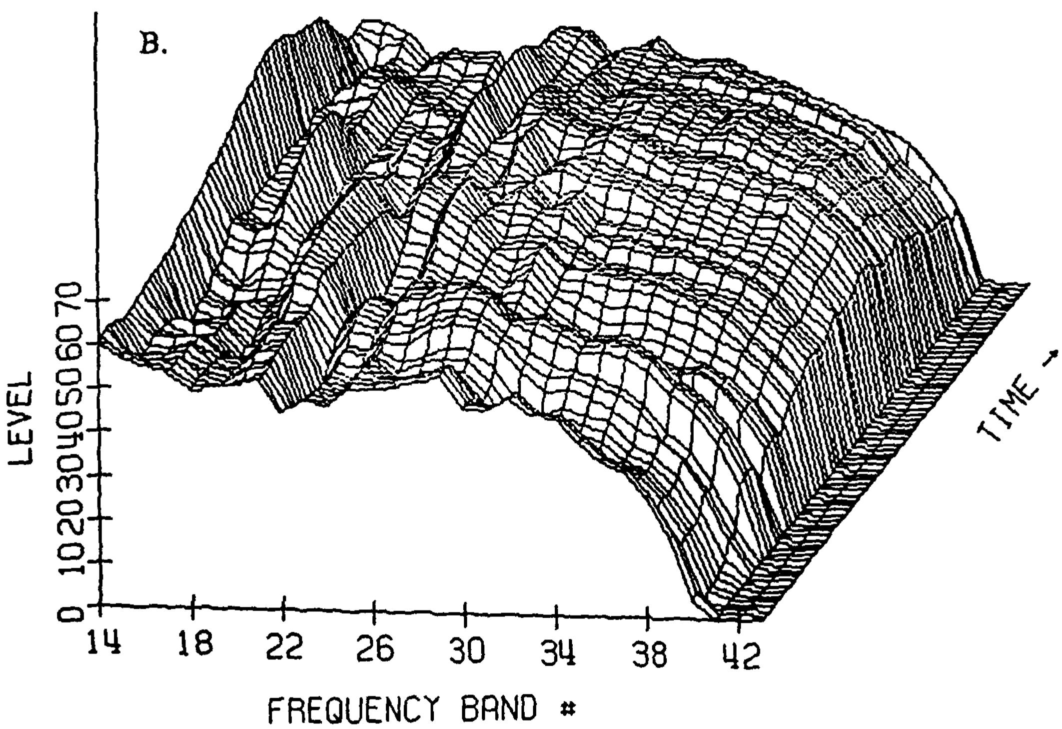
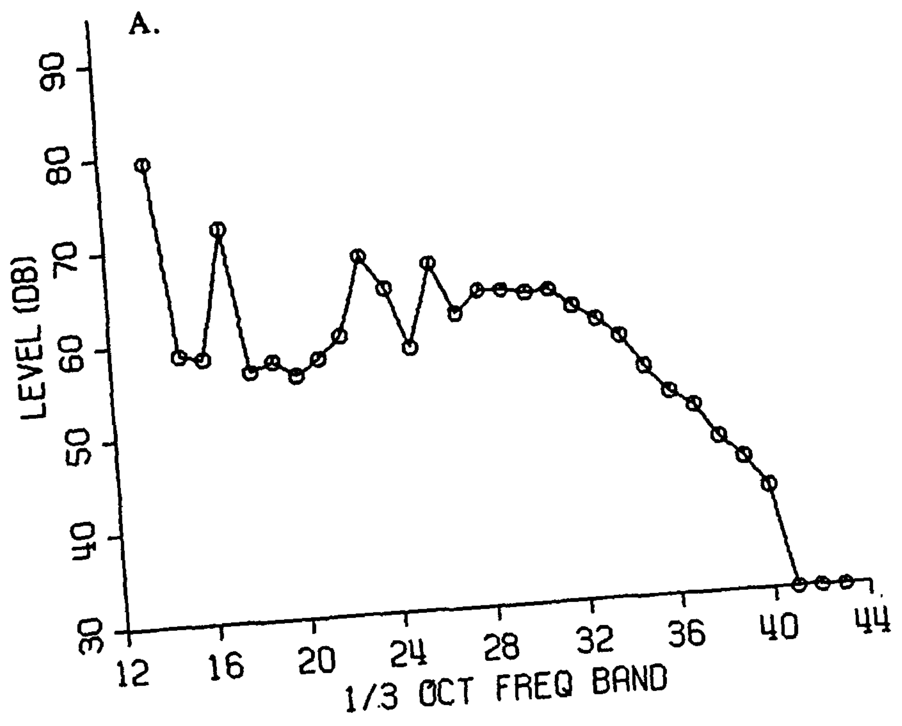


FIGURE C-H-2-2: EVENT C30 - TAKEOFF - 07/23/91
SCHWEIZER 330 - CONFIGURATION H
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



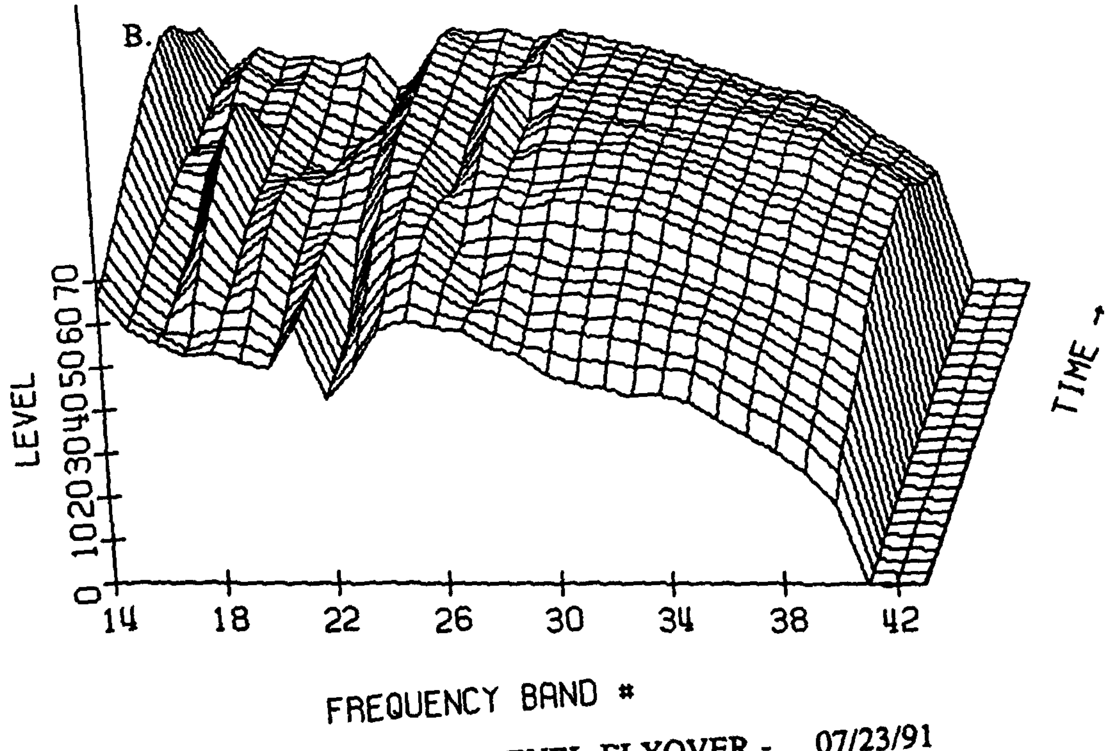


FIGURE C-H-2-3: EVENT A6 - LEVEL FLYOVER - 07/23/91
SCHWEIZER 330 - CONFIGURATION H
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

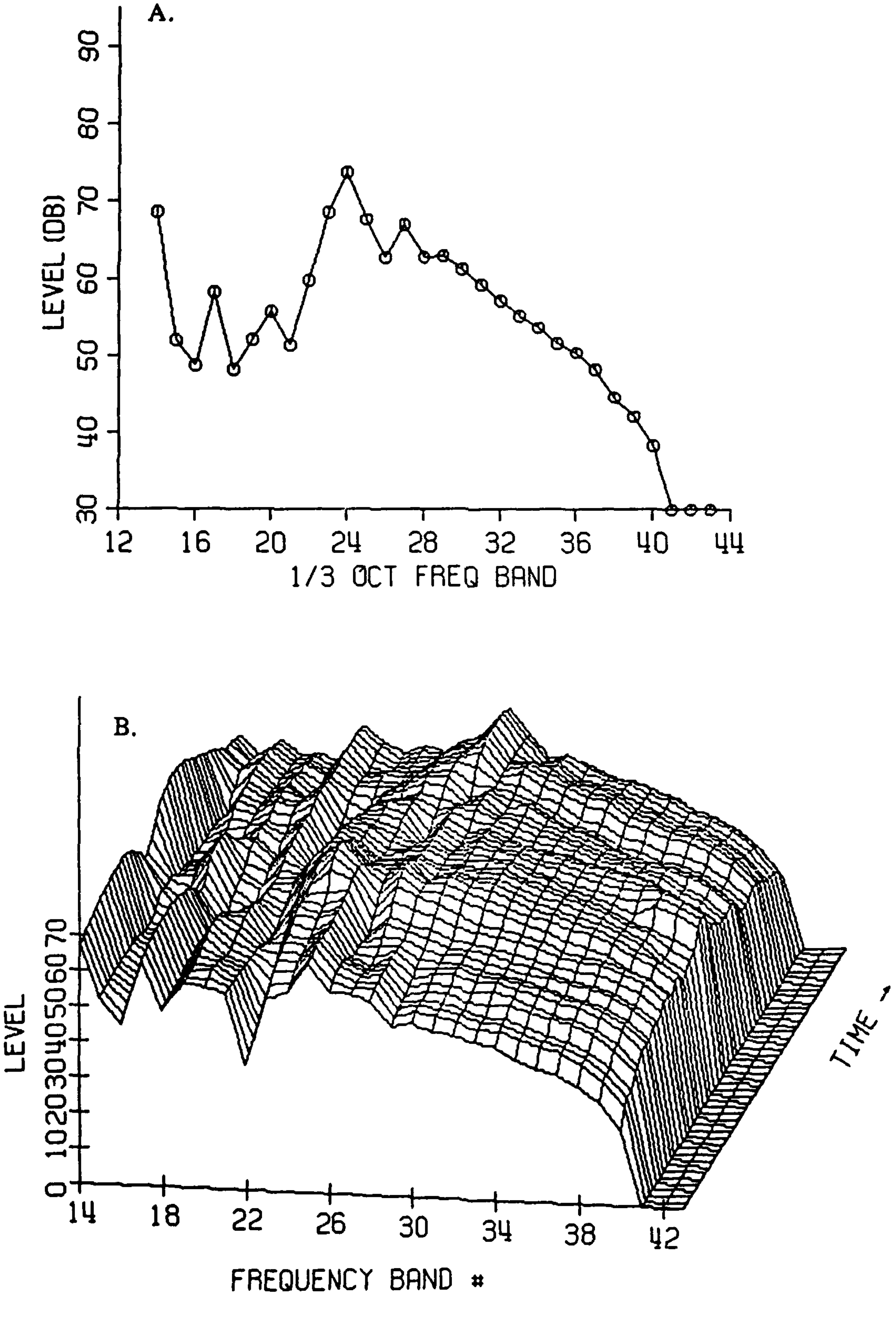
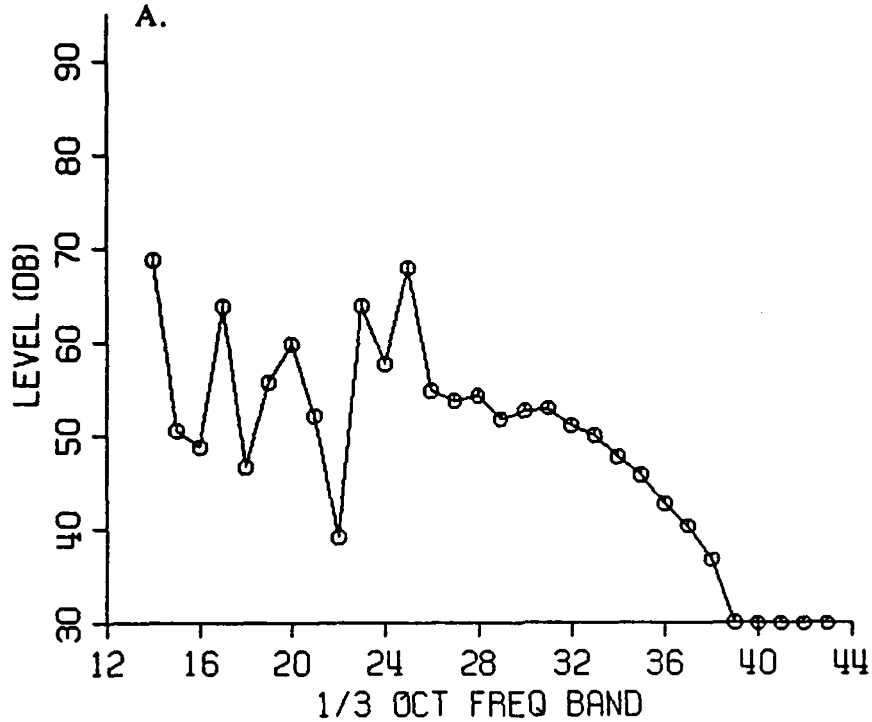


FIGURE C-H-3-1: EVENT B17 - APPROACH - 07/23/91
SCHWEIZER 330 - CONFIGURATION H
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



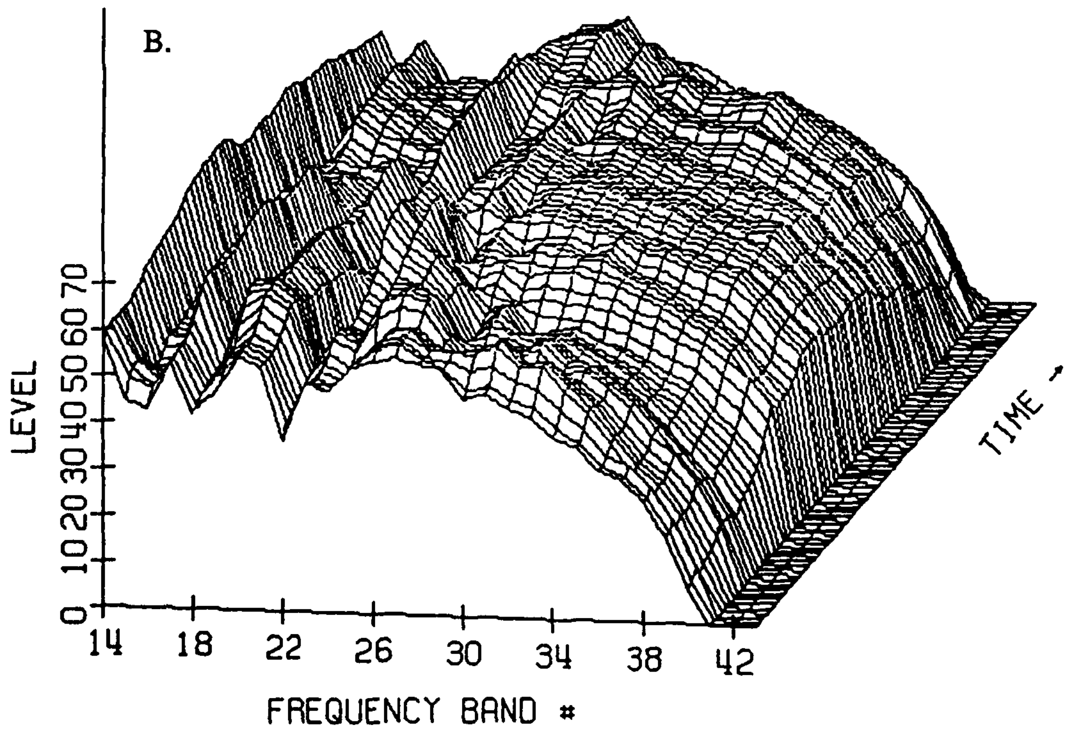
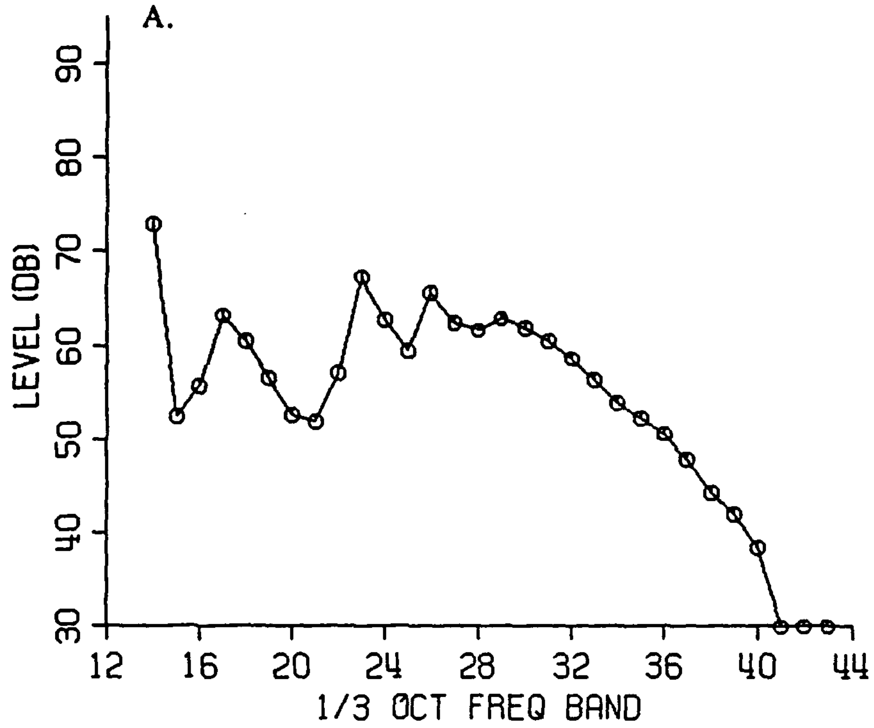


FIGURE C-H-3-2: EVENT C30 - TAKEOFF - 07/23/91
SCHWEIZER 330 - CONFIGURATION H
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



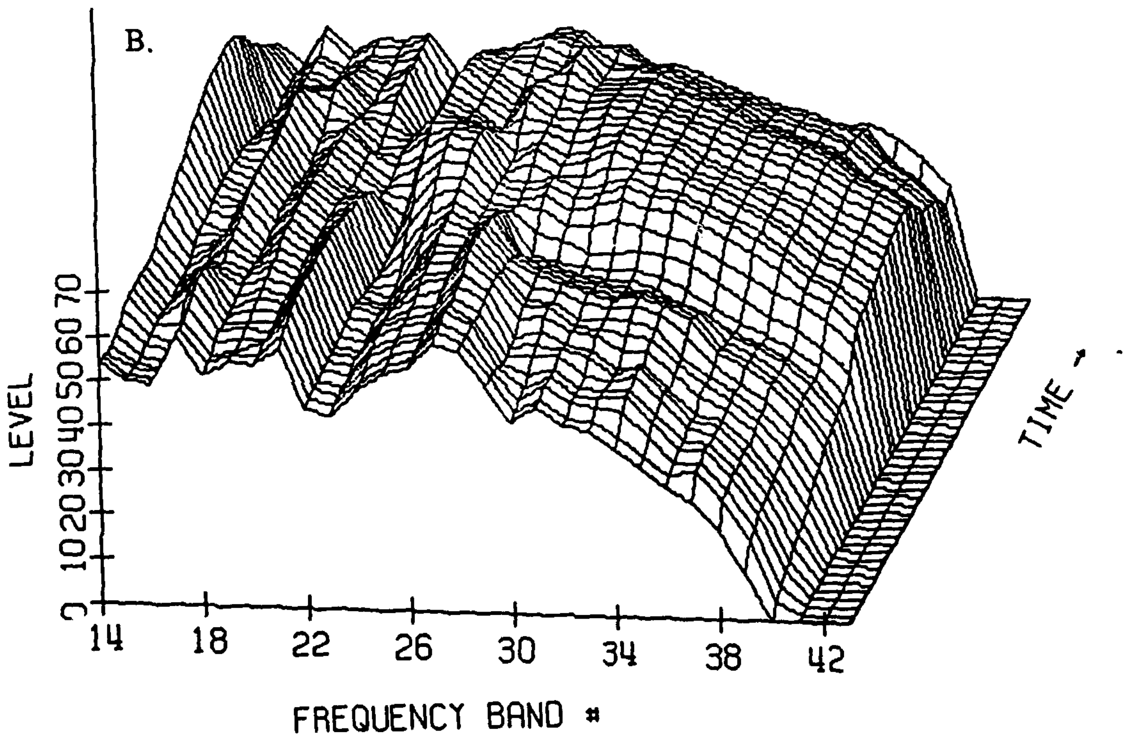
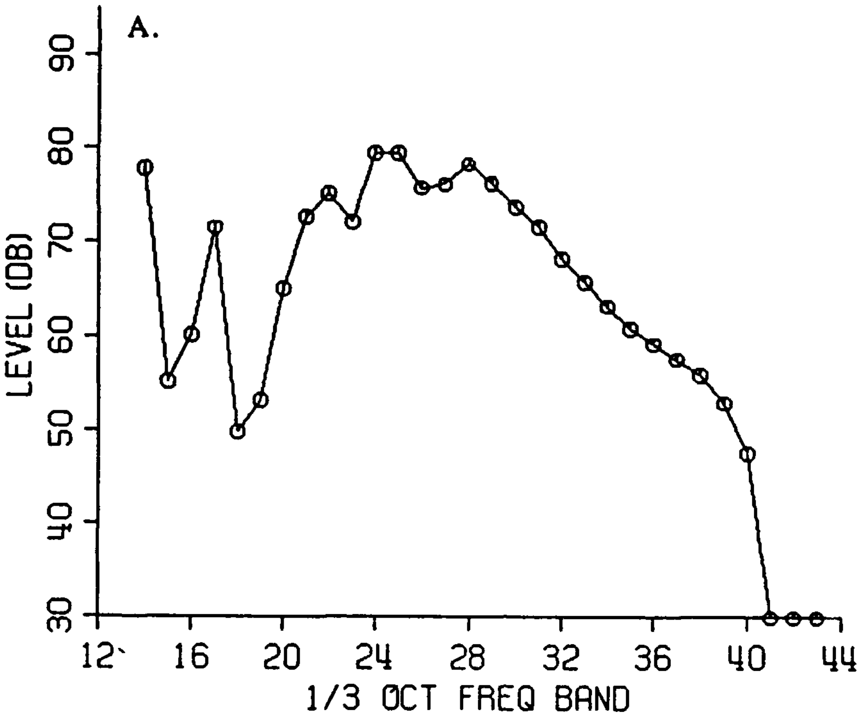


FIGURE C-H-3-3: EVENT A6 - LEVEL FLYOVER - 07/23/91
SCHWEIZER 330 - CONFIGURATION H
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



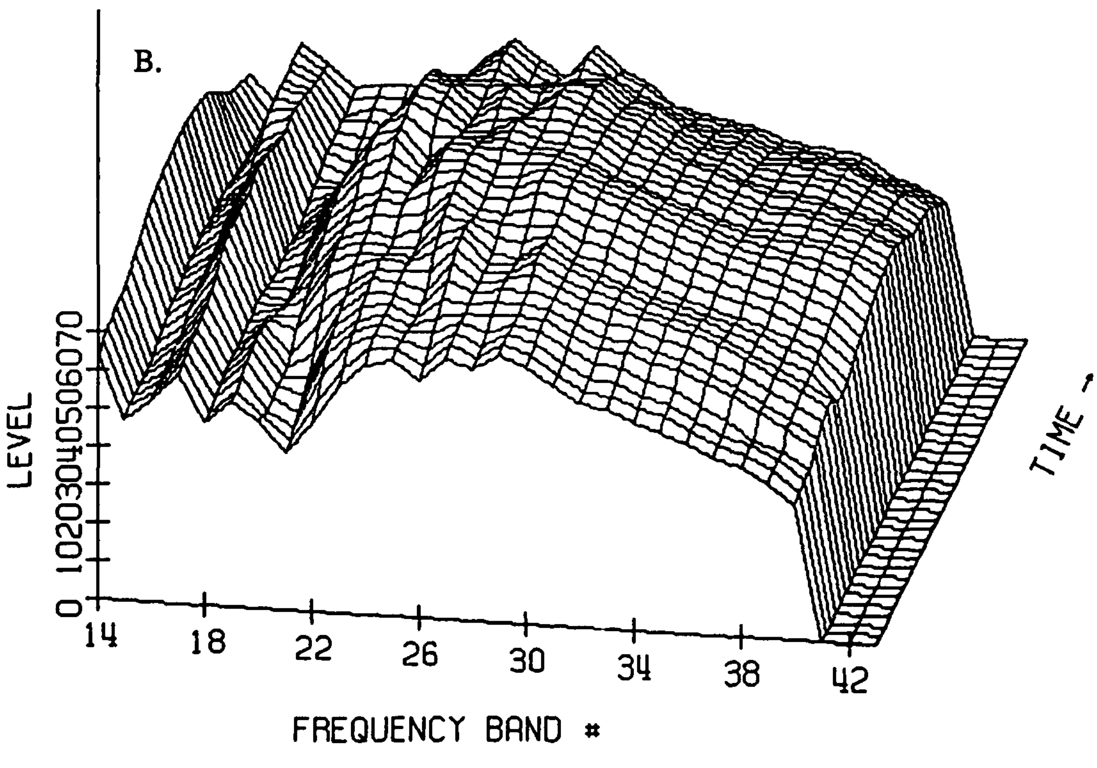
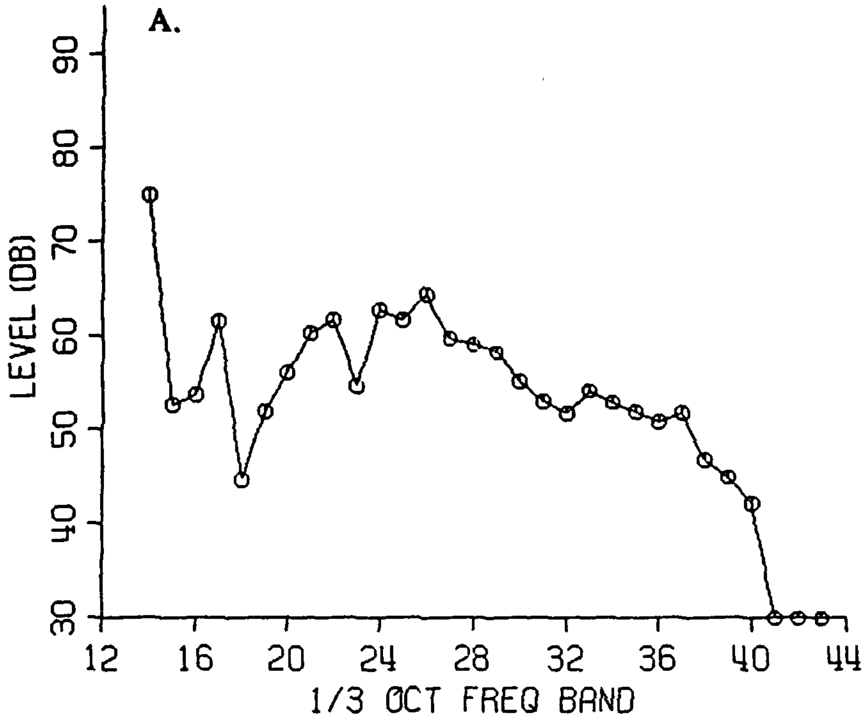


FIGURE C-I-1-1: EVENT B21 - APPROACH - 07/24/91
SCHWEIZER 330 - CONFIGURATION I
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



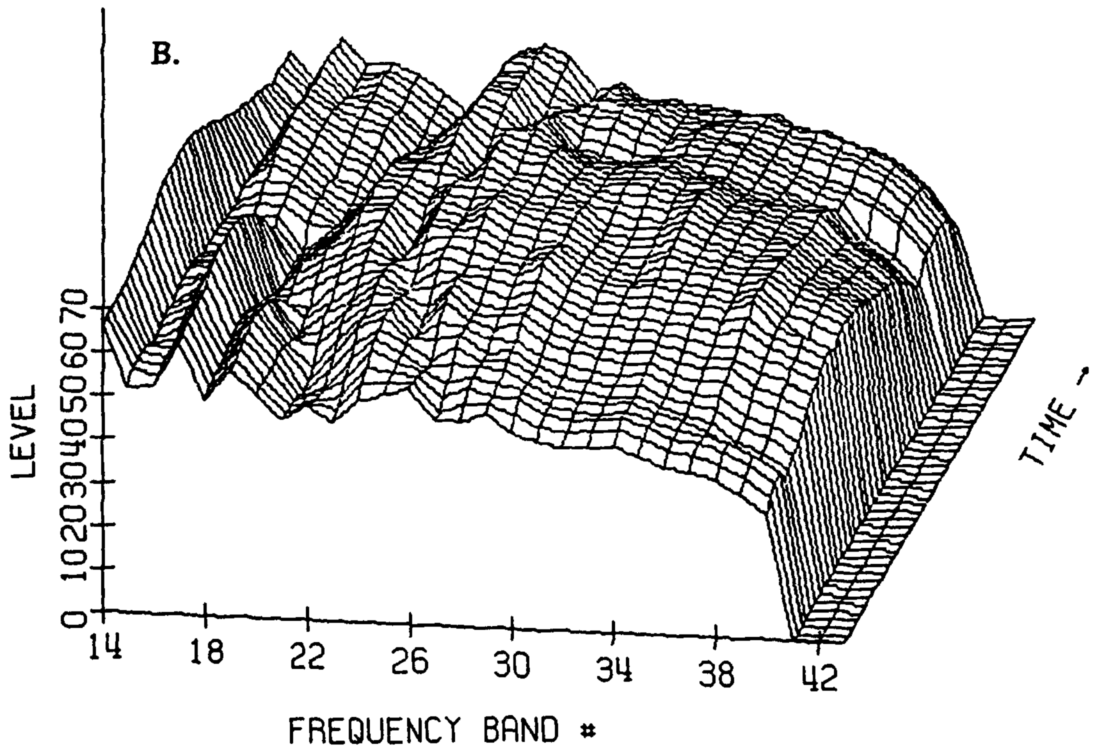
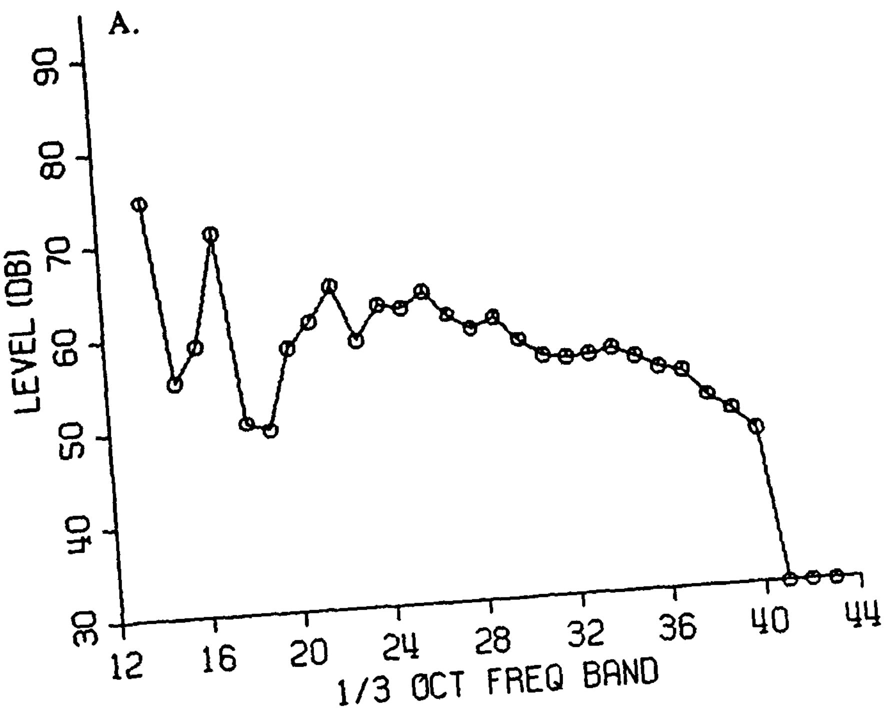


FIGURE C-I-1-2: EVENT C24 - TAKEOFF - 07/24/91
SCHWEIZER 330 - CONFIGURATION I
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRL OCTAVE TIME HISTORY



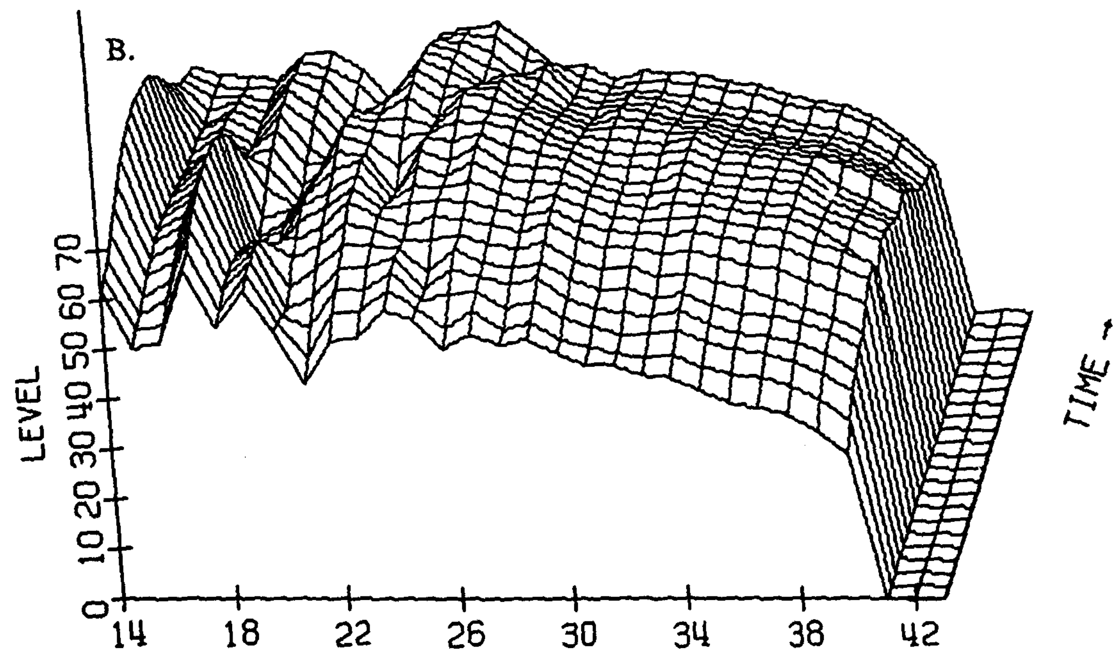
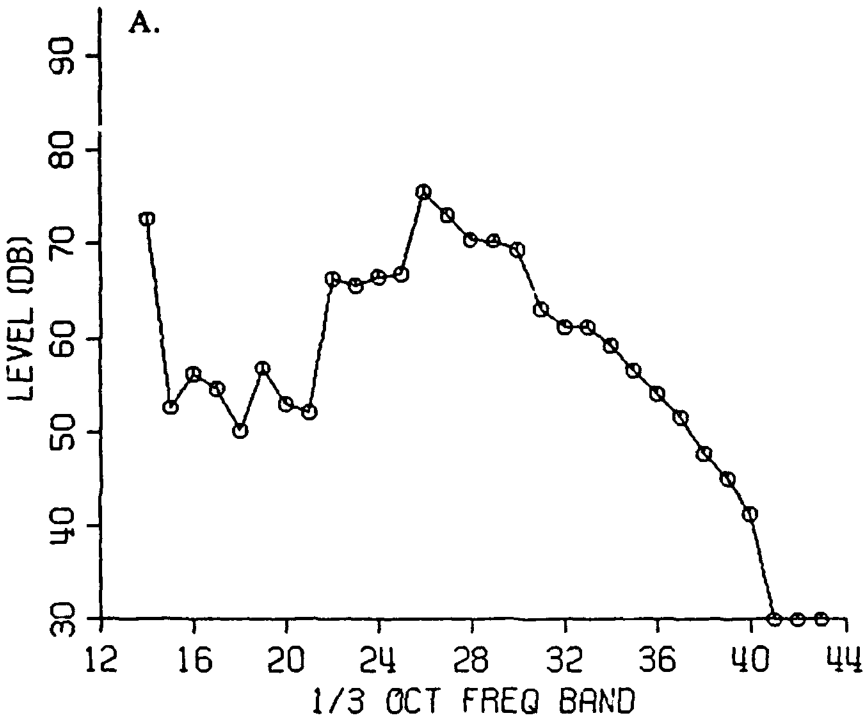


FIGURE C-I-1-3: EVENT A3 - LEVEL FLYOVER - 07/24/91
SCHWEIZER 330 - CONFIGURATION I
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



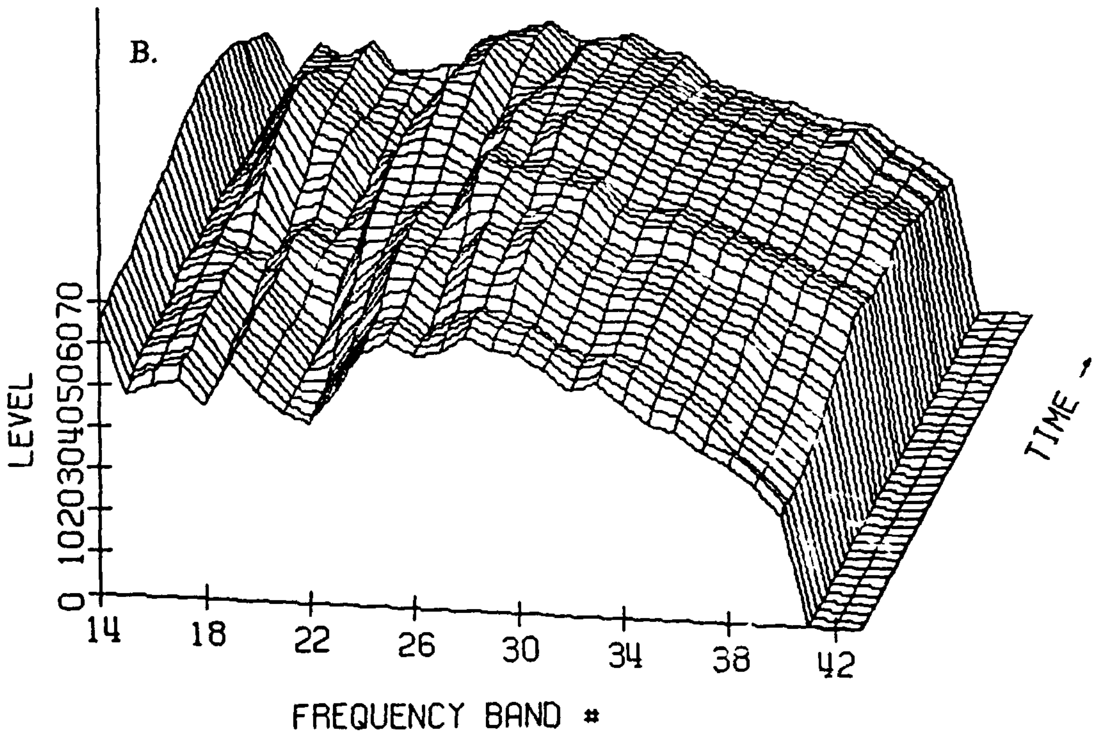


FIGURE C-I-2-1: EVENT B21 - APPROACH - 07/24/91
SCHWEIZER 330 - CONFIGURATION I
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

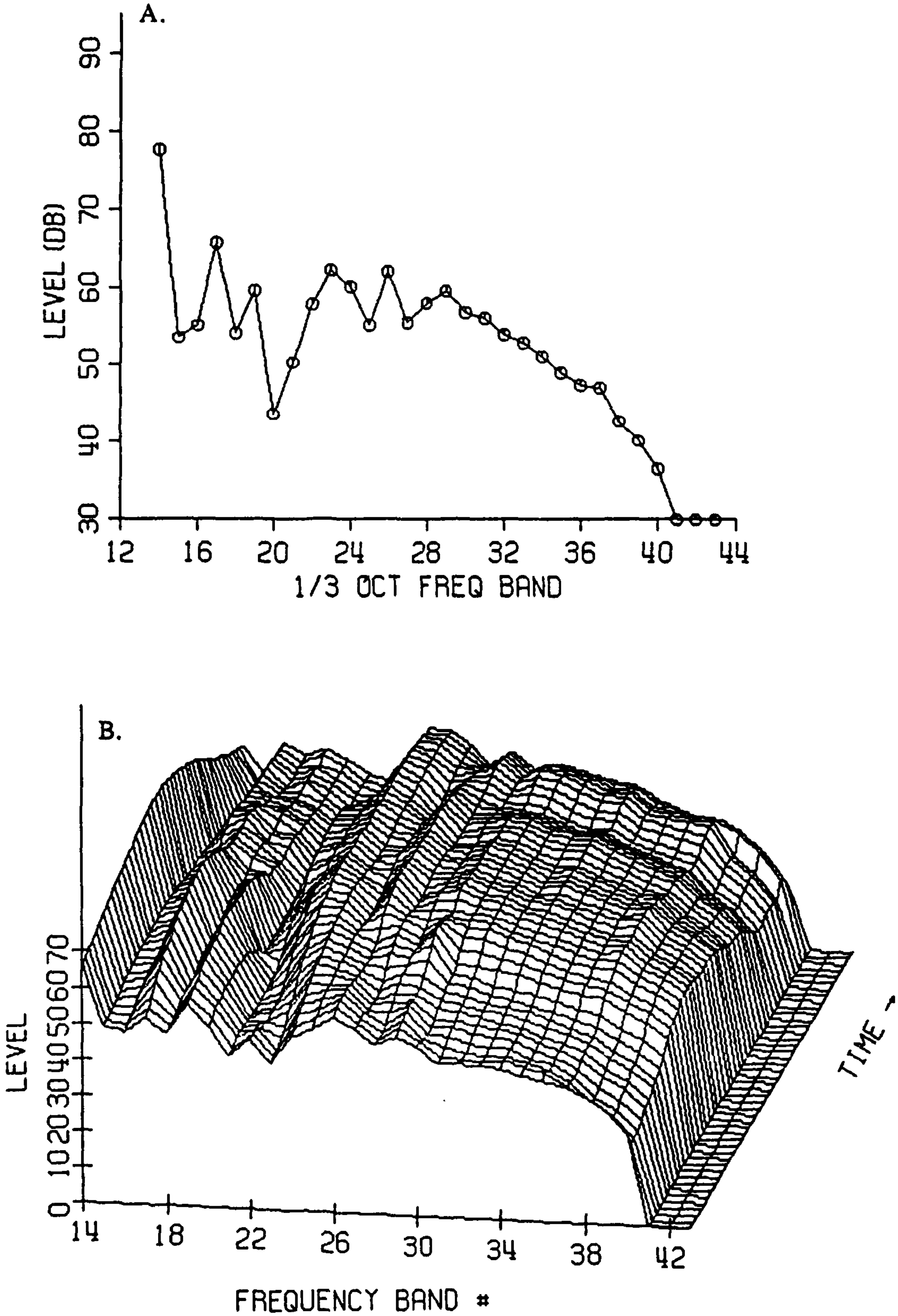
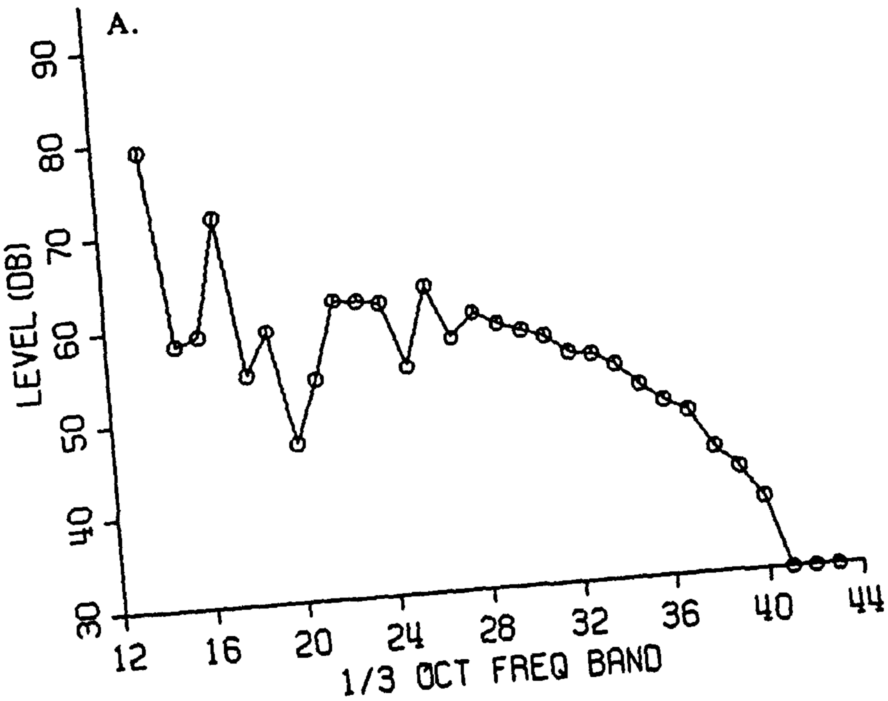


FIGURE C-I-2-2: EVENT C24 - TAKEOFF - 07/24/91
SCHWEIZER 330 - CONFIGURATION I
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



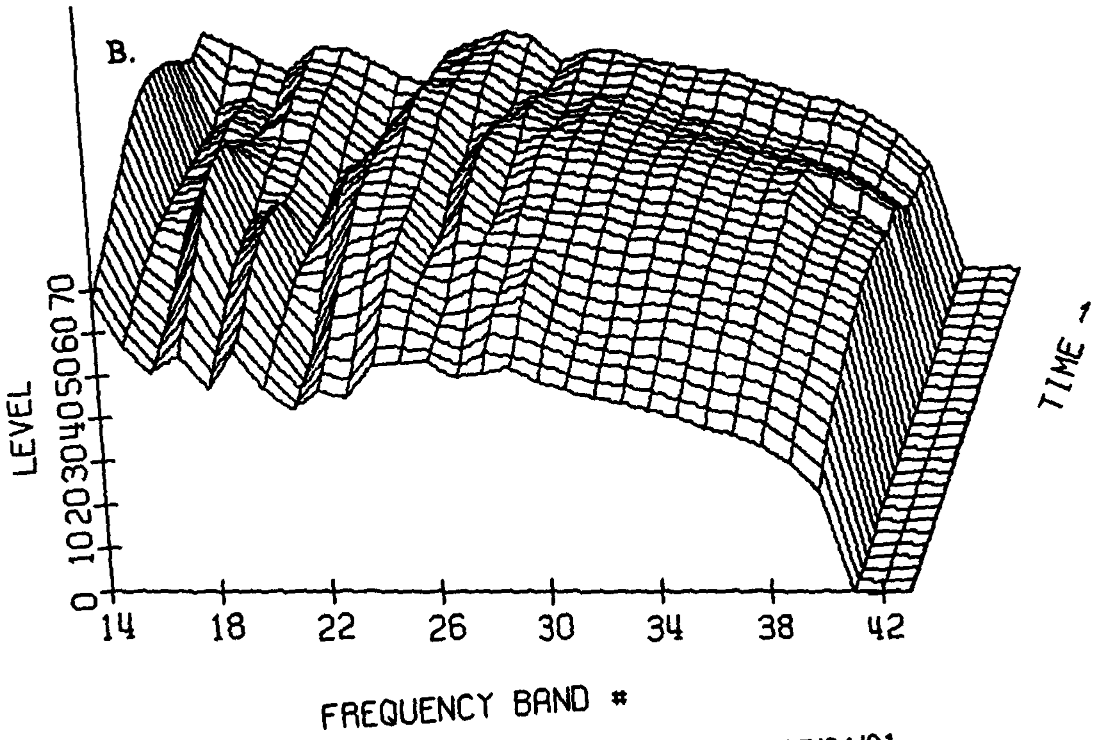
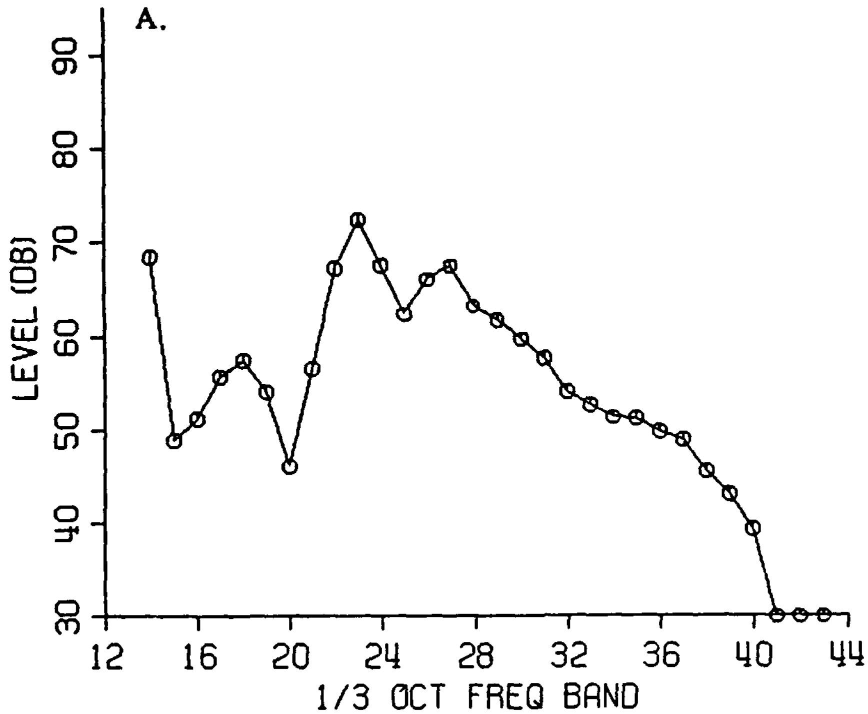


FIGURE C-I-2-3: EVENT A3 - LEVEL FLYOVER - 07/24/91
SCHWEIZER 330 - CONFIGURATION I
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



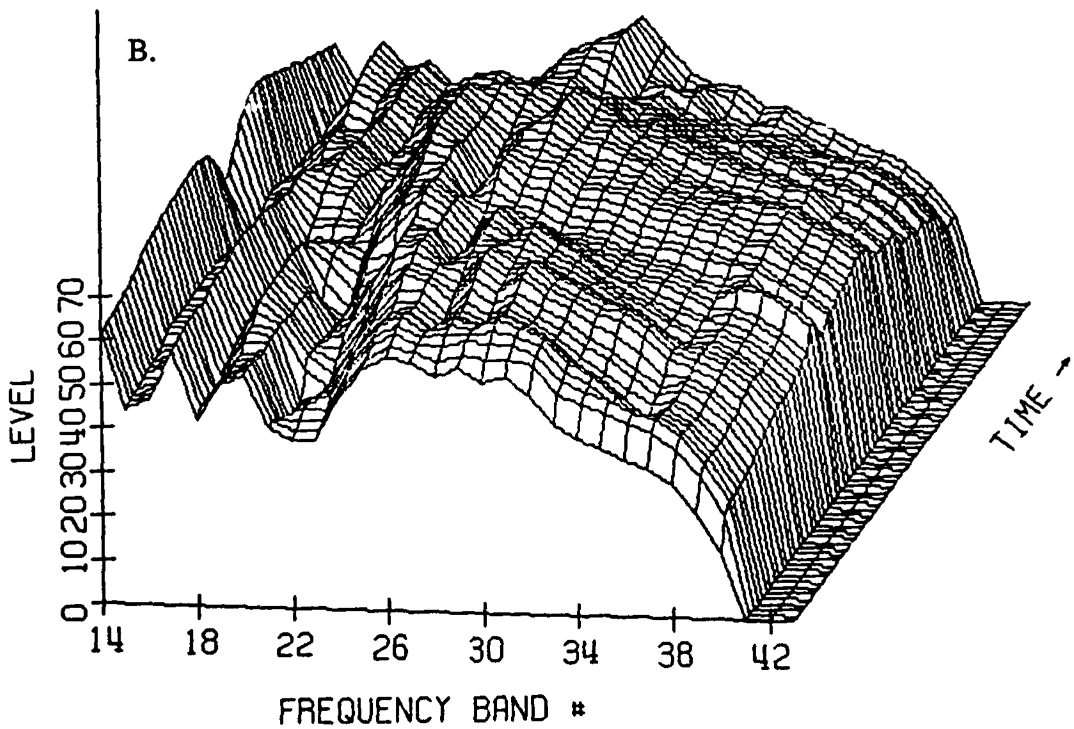


FIGURE C-I-3-1: EVENT B21 - APPROACH - 07/24/91
SCHWEIZER 330 - CONFIGURATION I
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

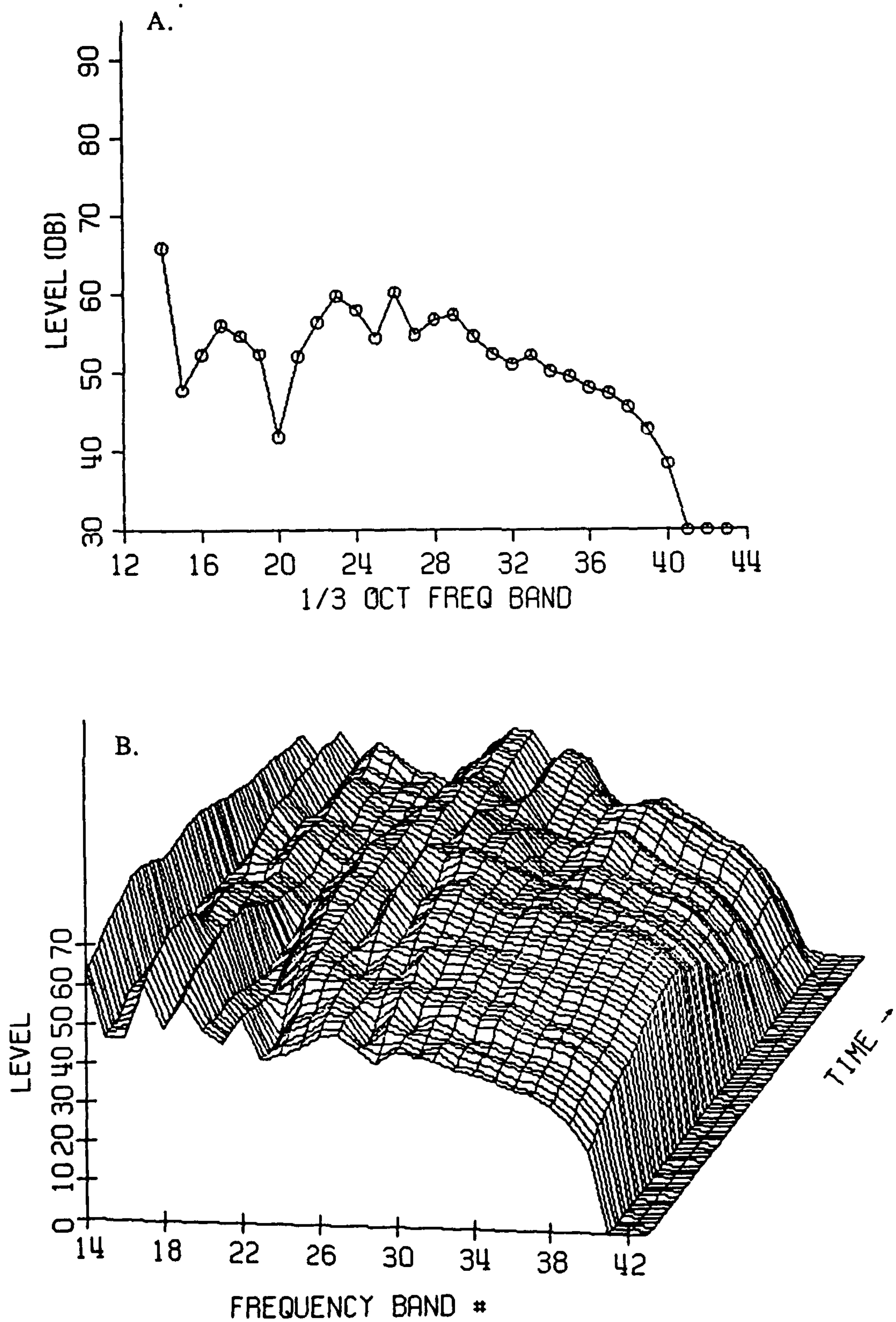
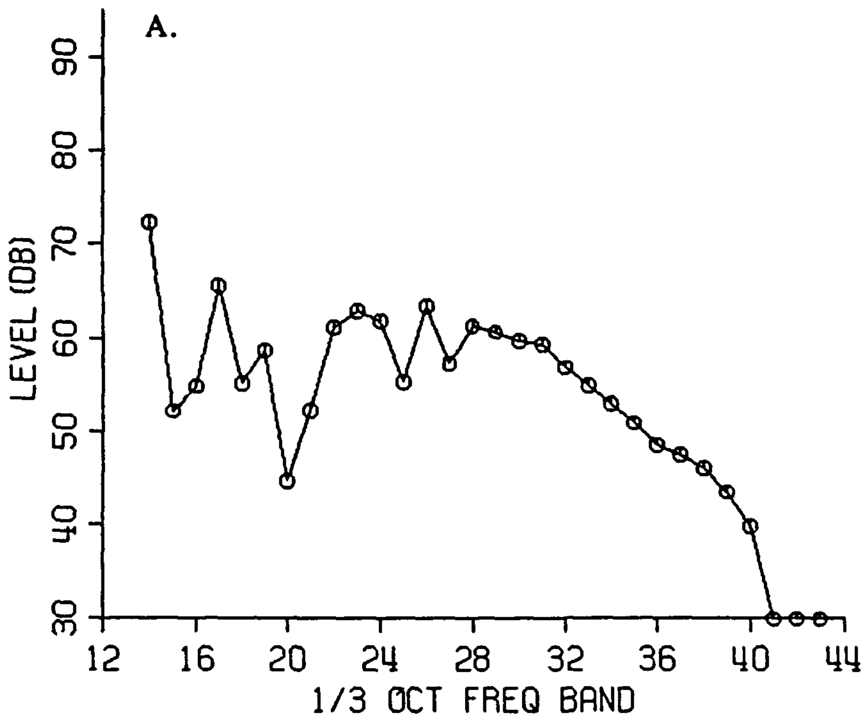


FIGURE C-I-3-2: EVENT C24 - TAKEOFF - 07/24/91
SCHWEIZER 330 - CONFIGURATION I
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



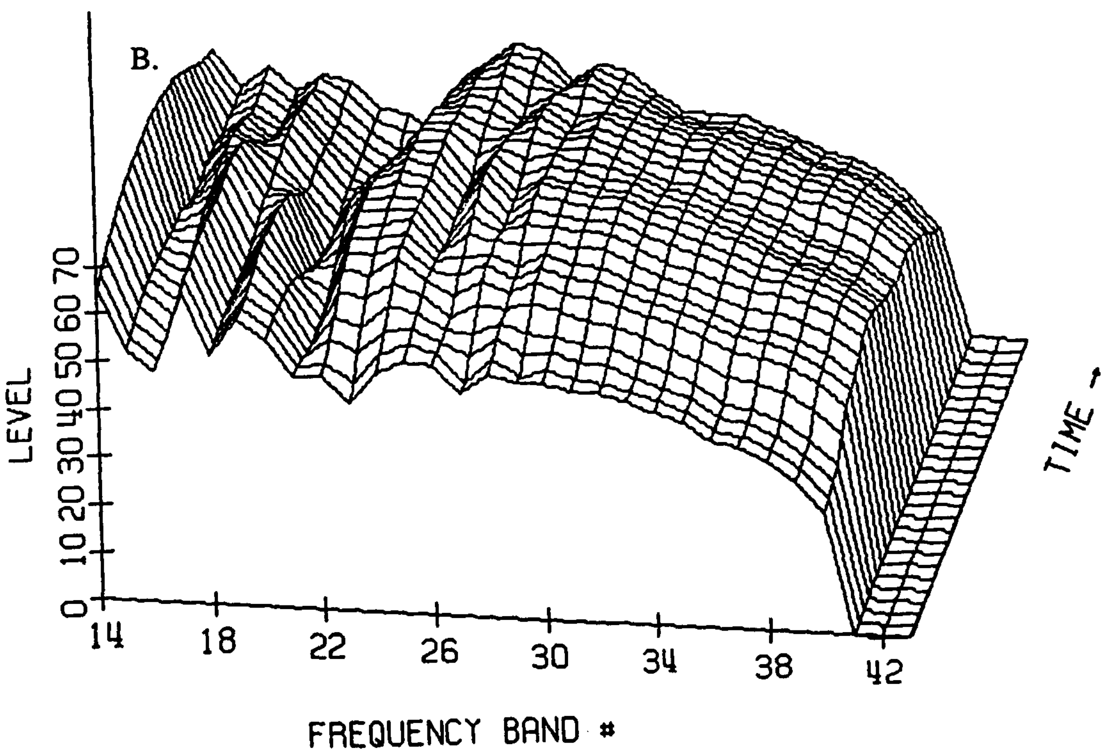
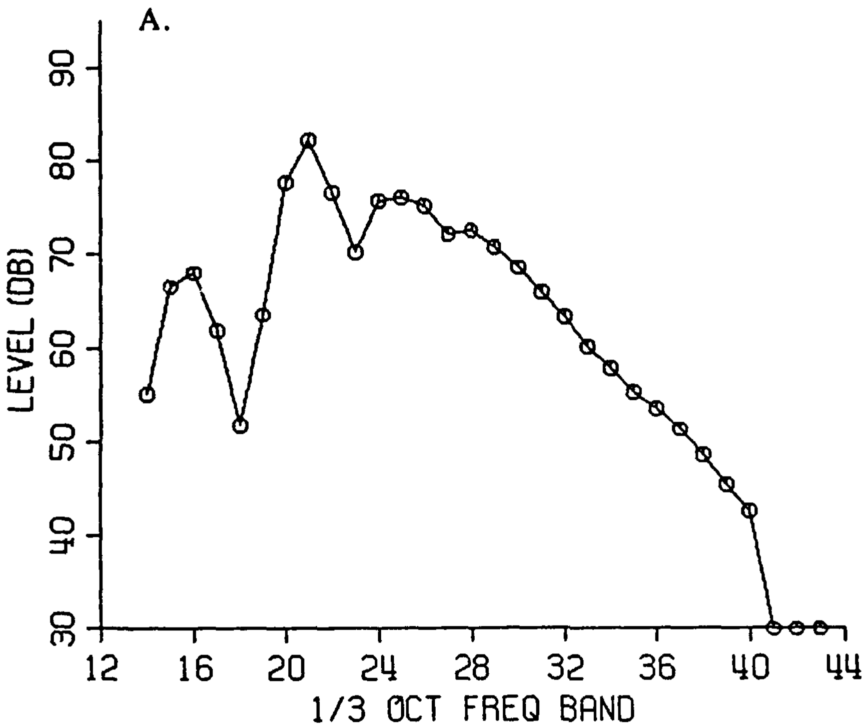


FIGURE C-I-3-3: EVENT A3 - LEVEL FLYOVER - 07/24/91
SCHWEIZER 330 - CONFIGURATION I
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



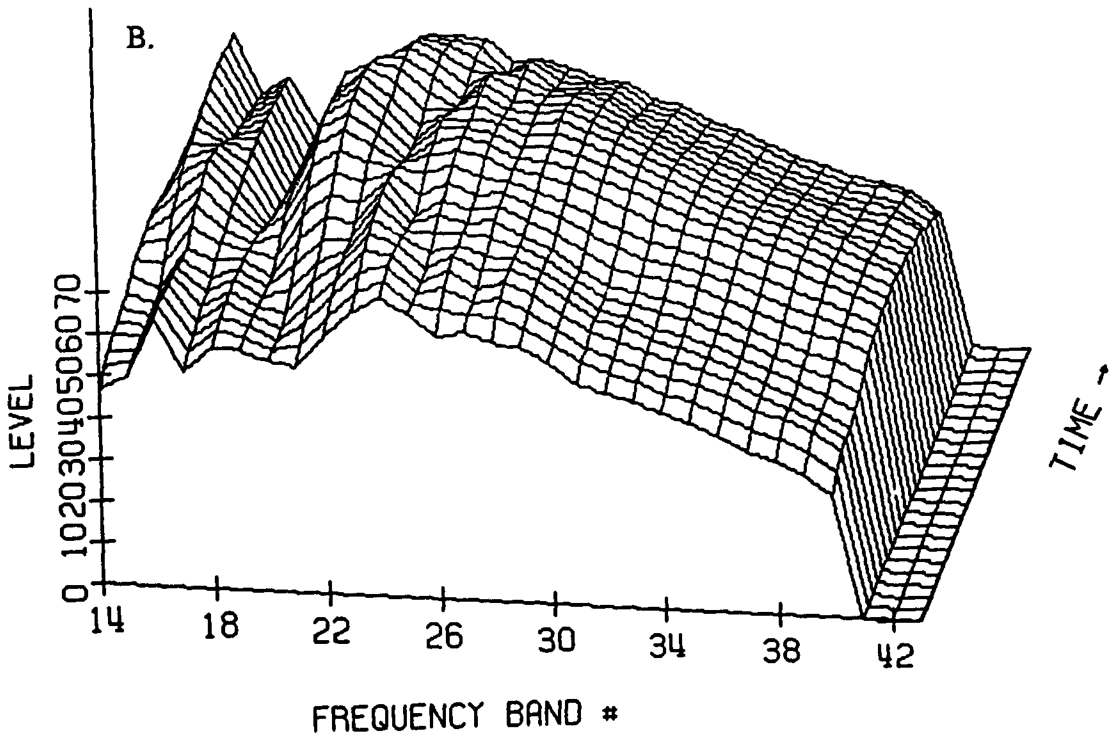
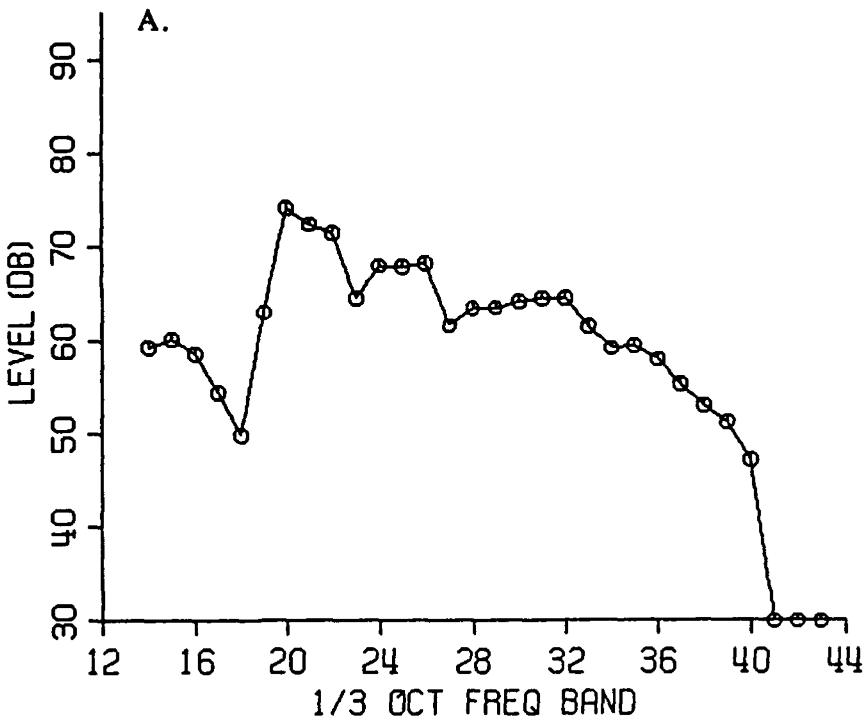


FIGURE C-J-1-1: EVENT BP14 - APPROACH - 07/26/91
ENSTROM 280 FX
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



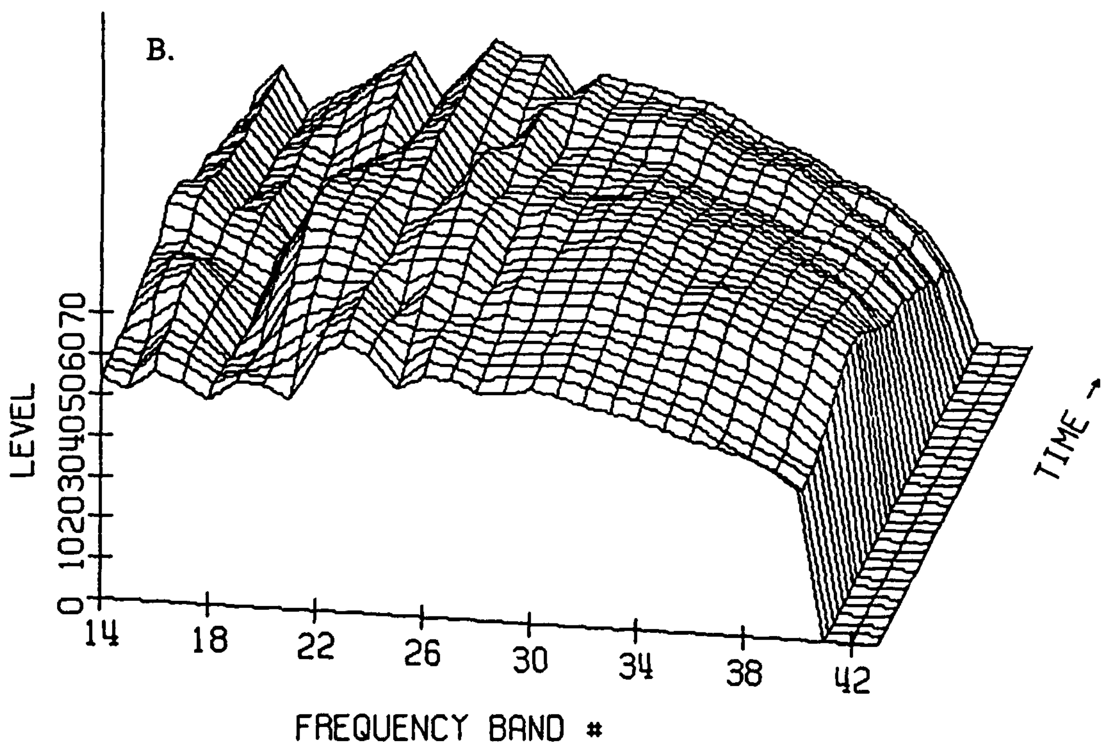
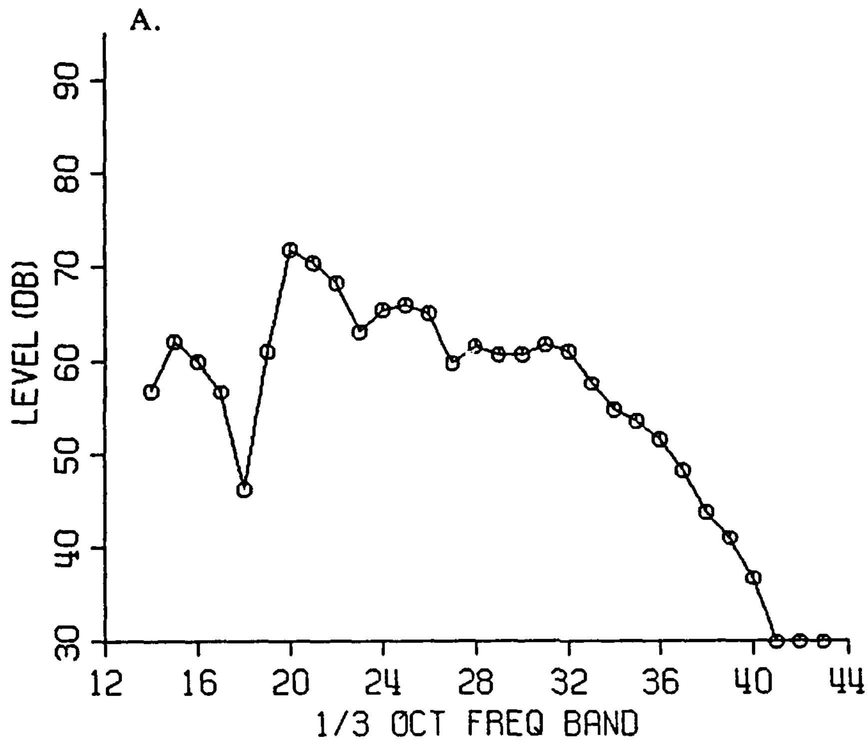


FIGURE C-J-1-2: EVENT CP22 - TAKEOFF - 07/26/91
ENSTROM 280 FX
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



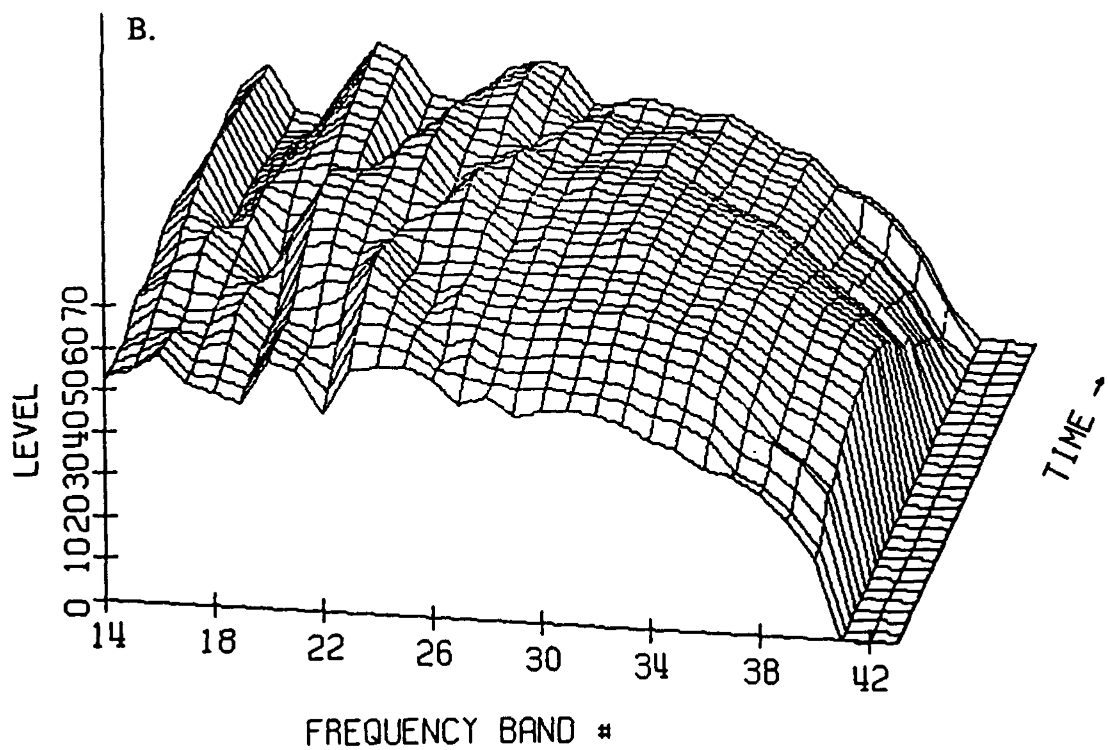
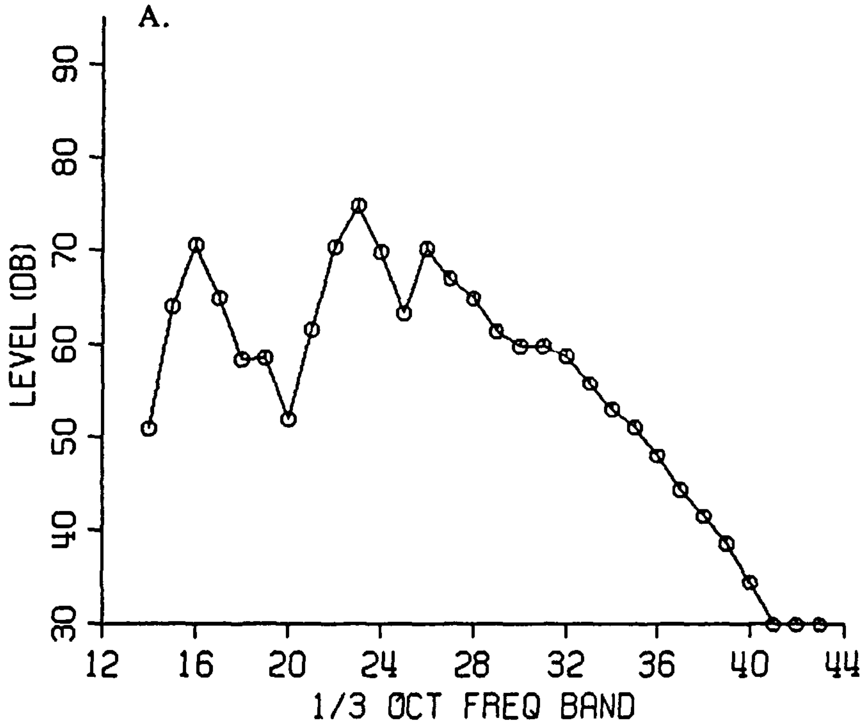


FIGURE C-J-1-3: EVENT AP42 - LEVEL FLYOVER - 07/26/91
ENSTROM 280 FX
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



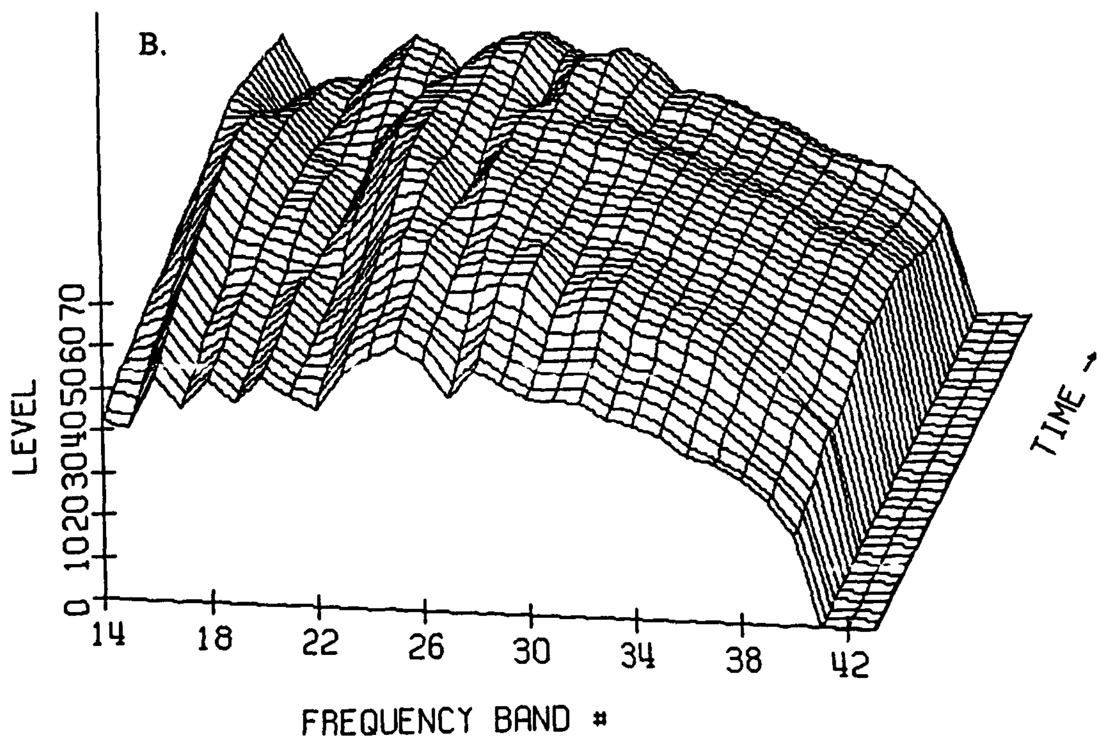
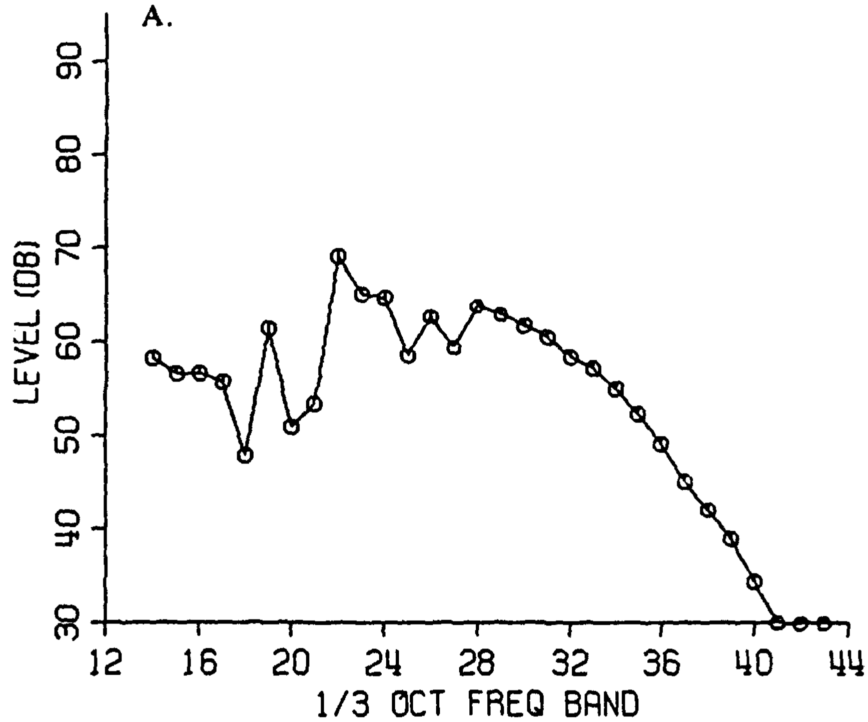


FIGURE C-J-2-1: EVENT BP14 - APPROACH - 07/26/91
ENSTROM 280 FX
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



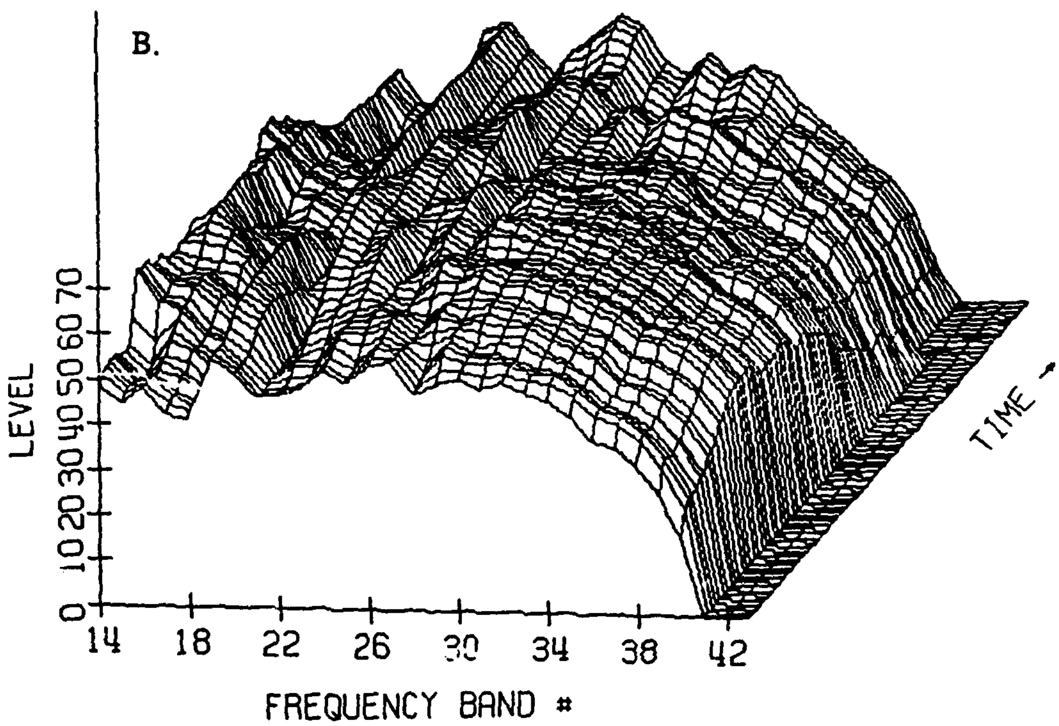
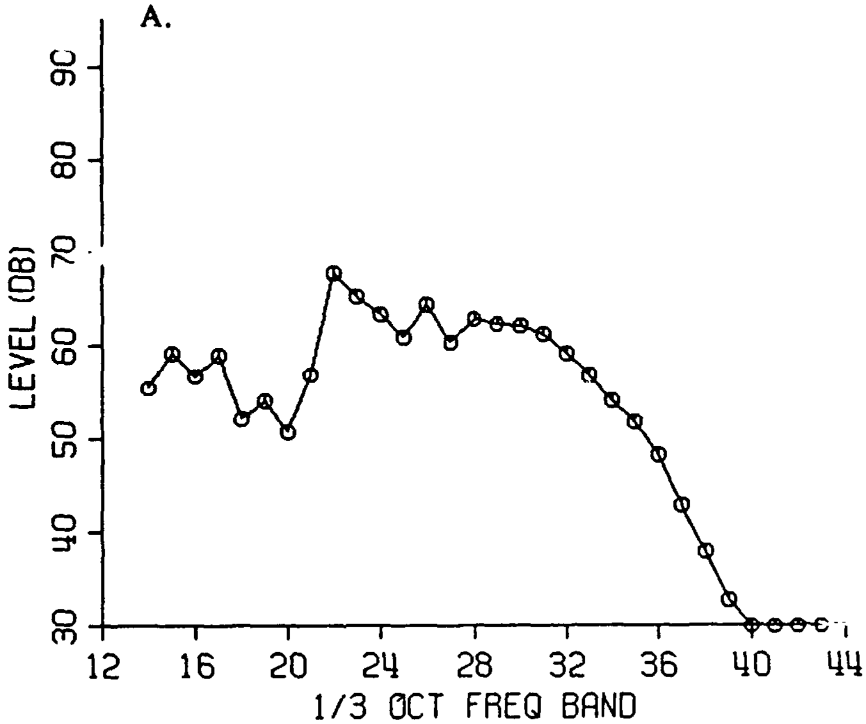


FIGURE C-J-2-2: EVENT CP22 - TAKEOFF - 07/26/91
ENSTROM 280 FX
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



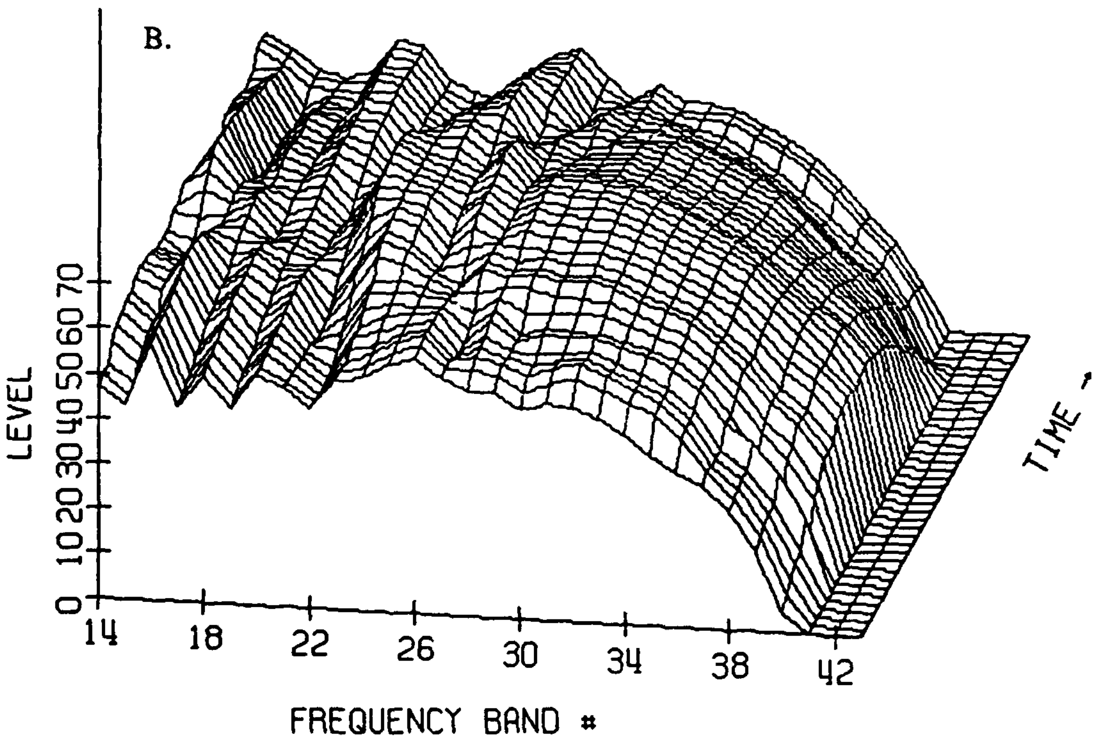
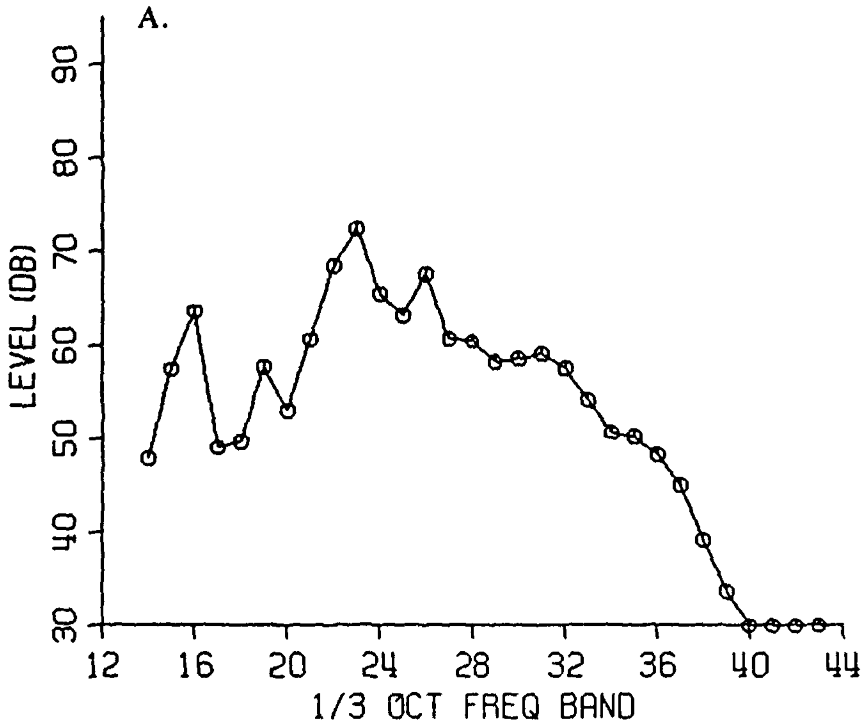


FIGURE C-J-2-3: EVENT AP42 - LEVEL FLYOVER - 07/26/91
ENSTROM 280 FX
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



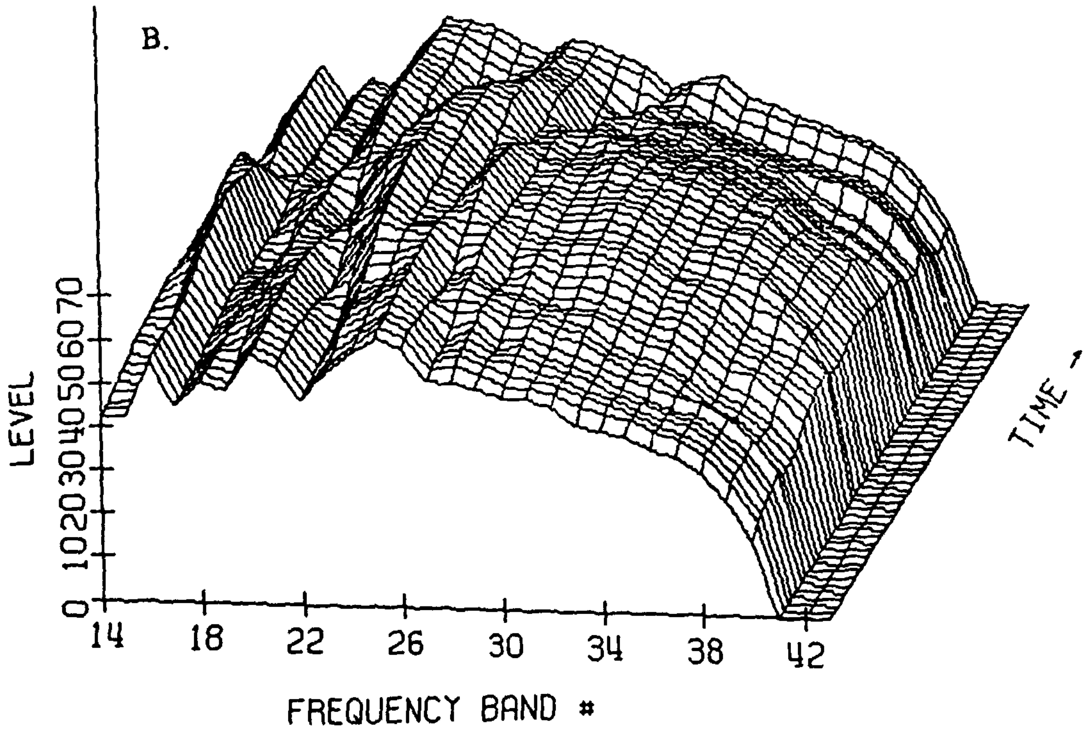
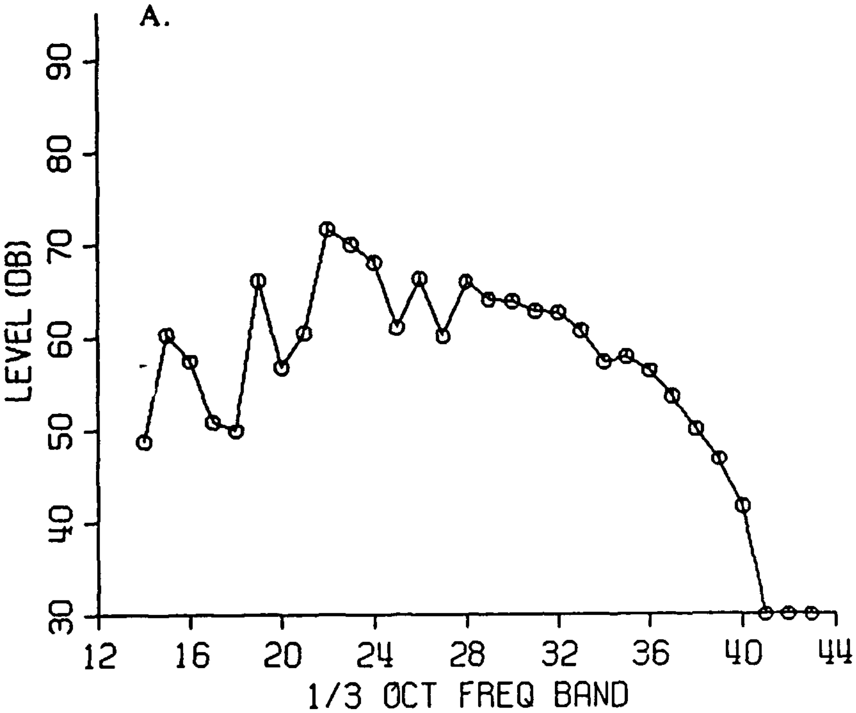


FIGURE C-J-3-1: EVENT BP14 - APPROACH - 07/26/91
ENSTROM 280 FX
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



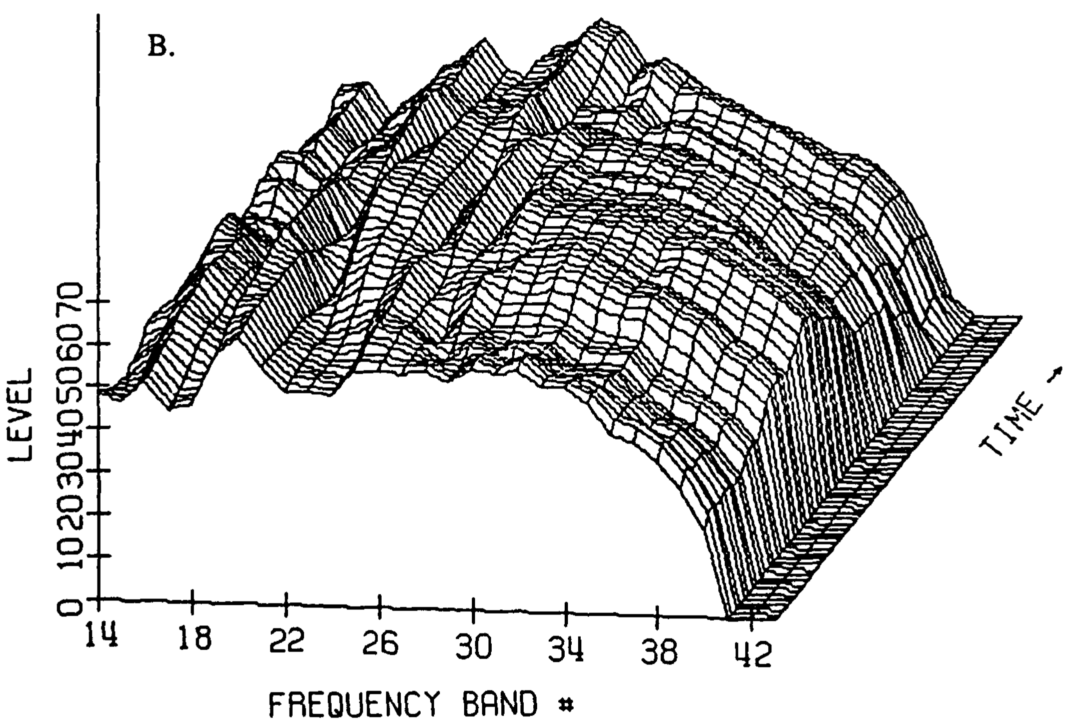
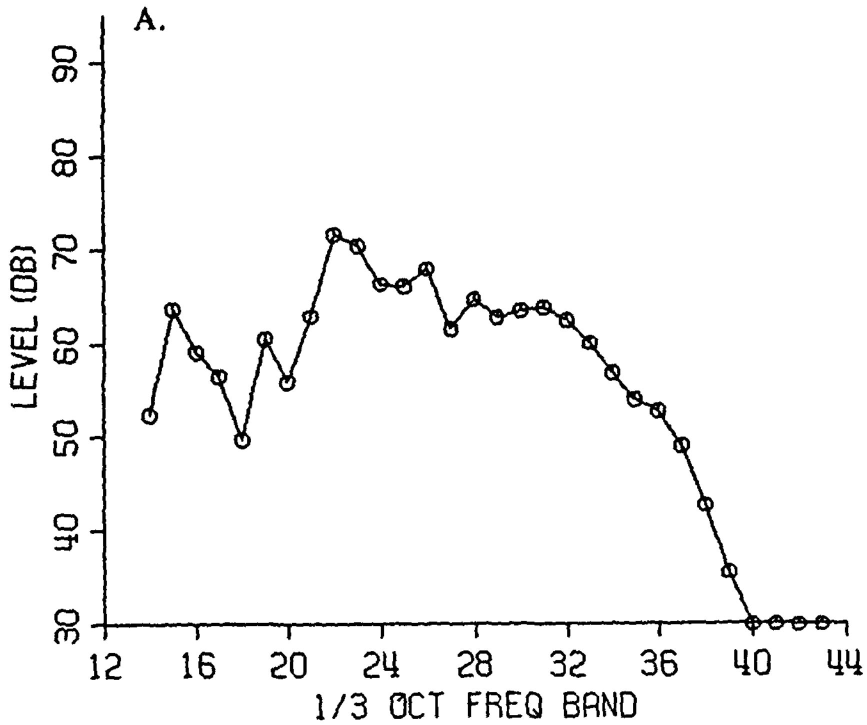


FIGURE C-J-3-2: EVENT CP22 - TAKEOFF - 07/26/91
ENSTROM 280 FX
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



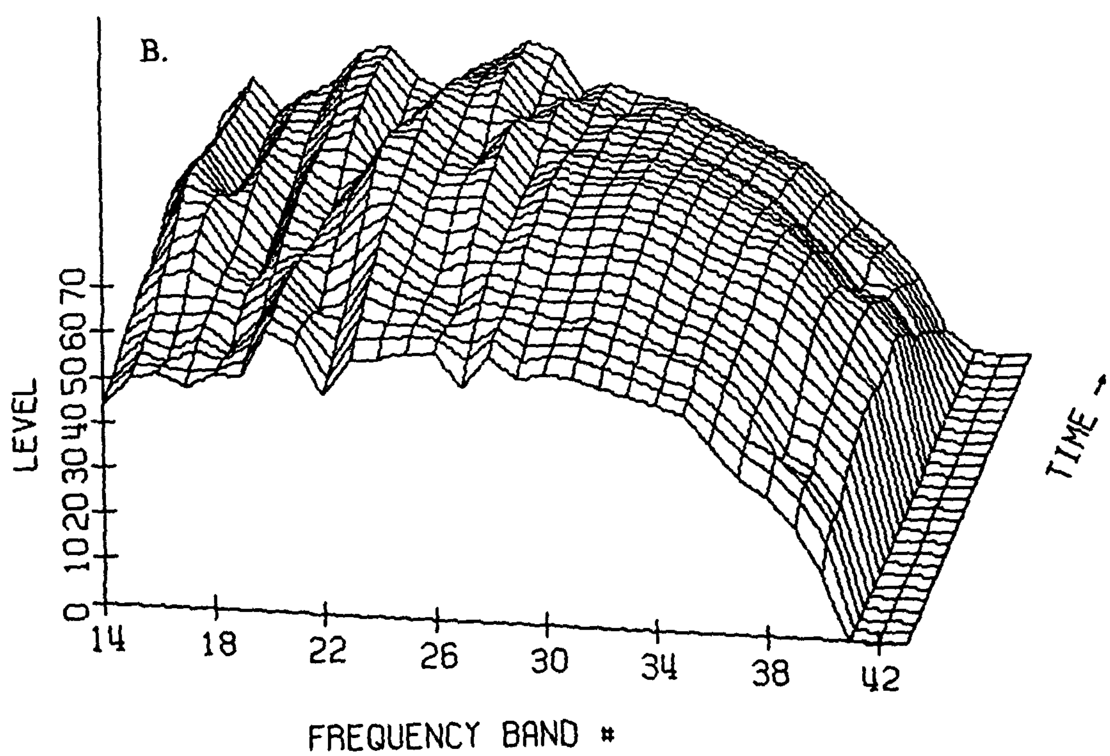
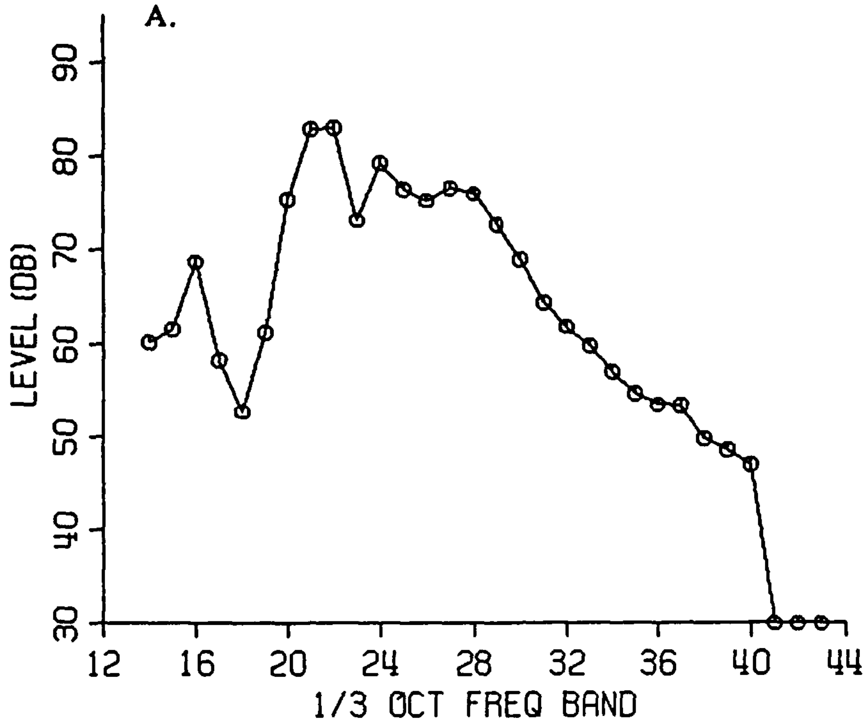


FIGURE C-J-3-3: EVENT AP42 - LEVEL FLYOVER - 07/26/91
ENSTROM 280 FX
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



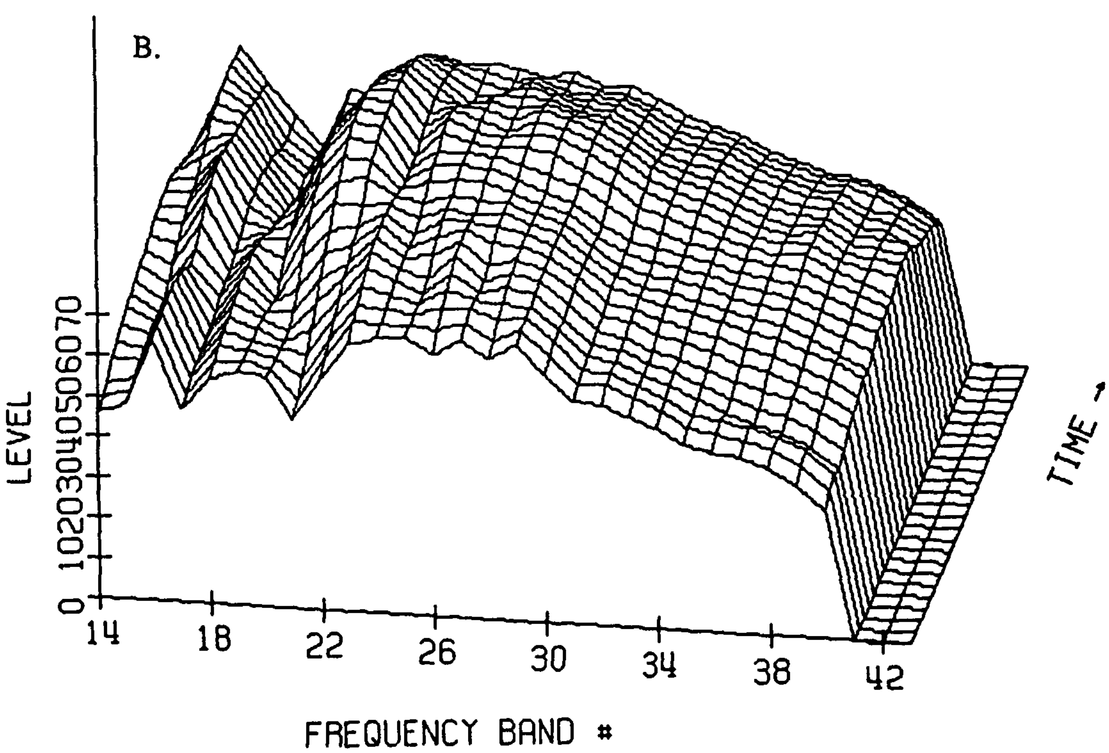
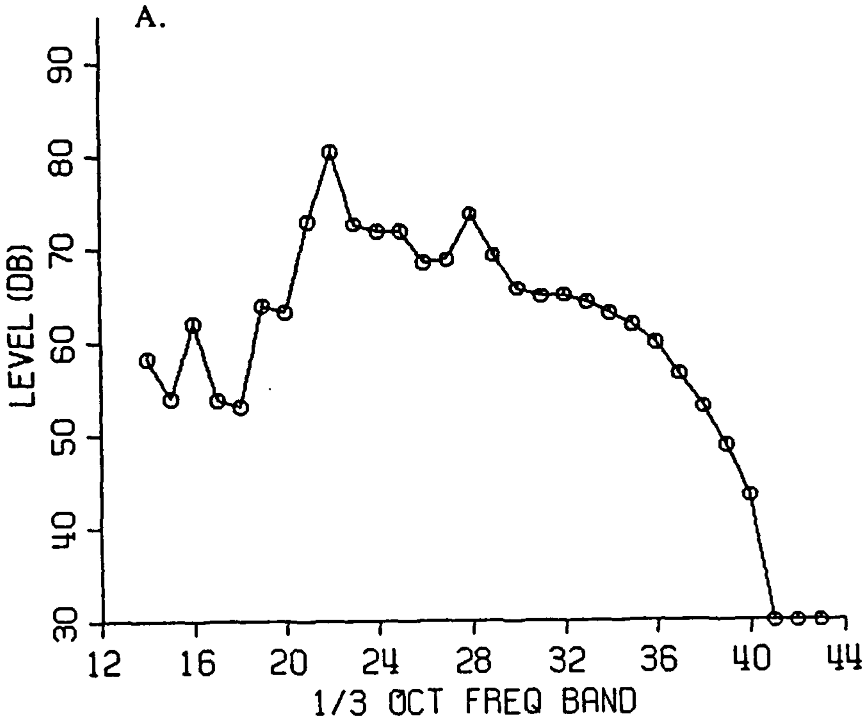


FIGURE C-K-1-1: EVENT BT7 - APPROACH - 07/26/91
ENSTROM TH28
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



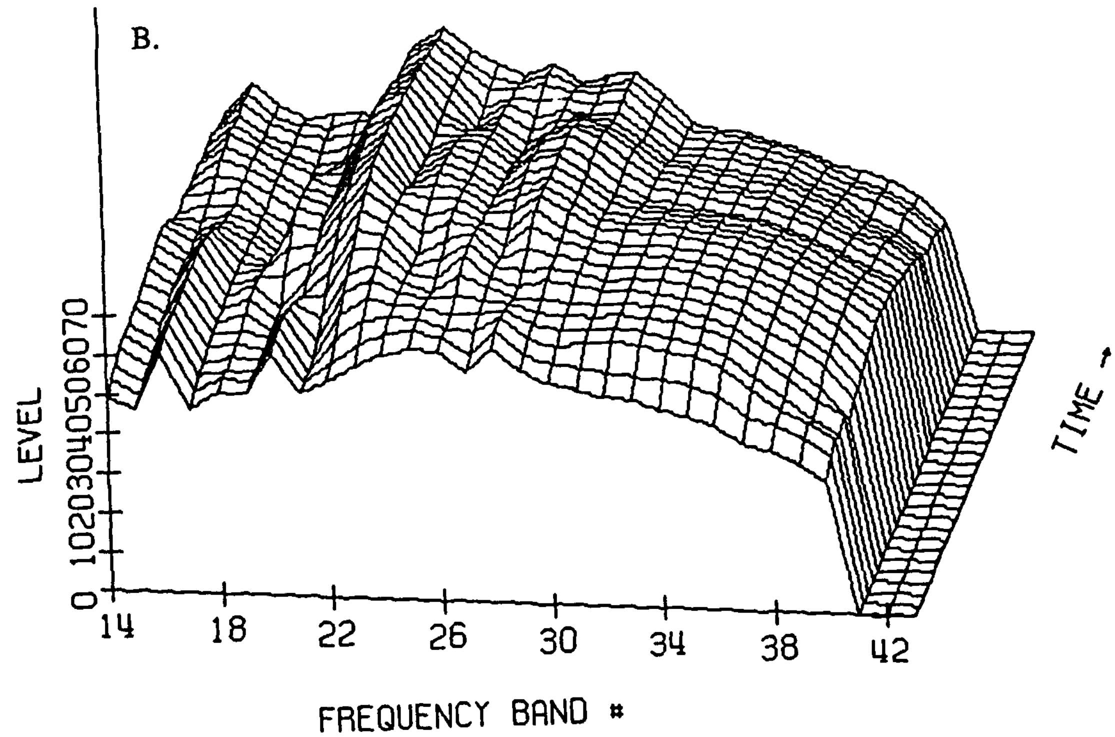
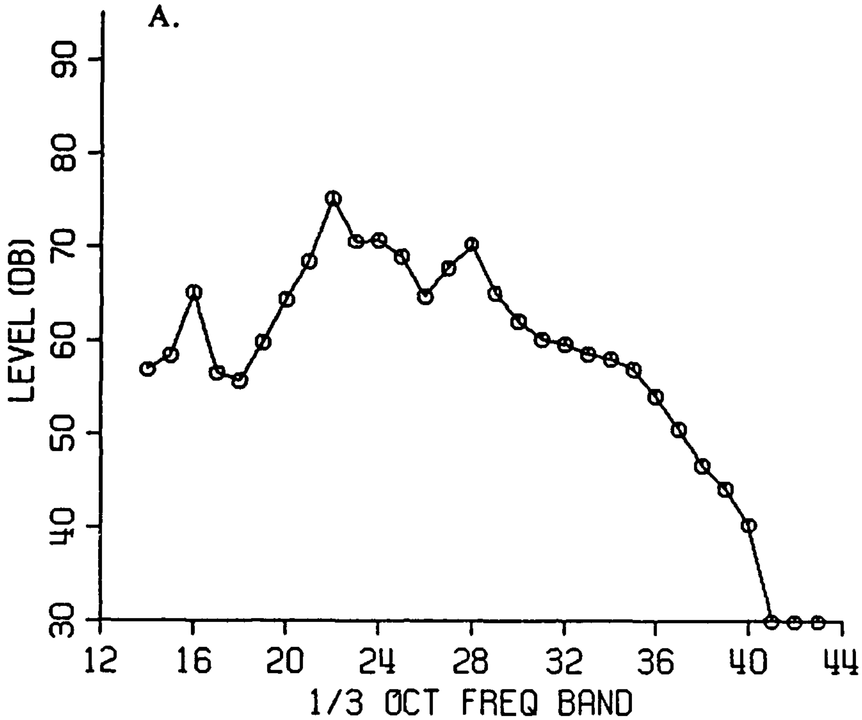


FIGURE C-K-1-2: EVENT CT19 - TAKEOFF - 07/26/91
ENSTROM TH28
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



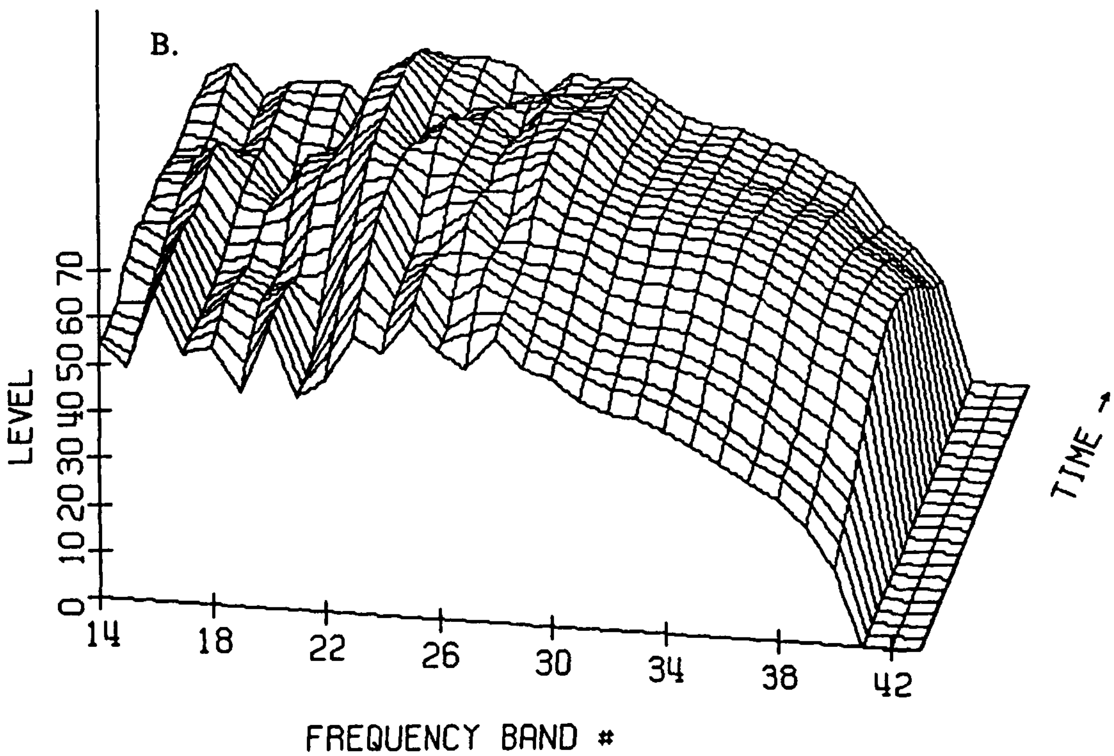
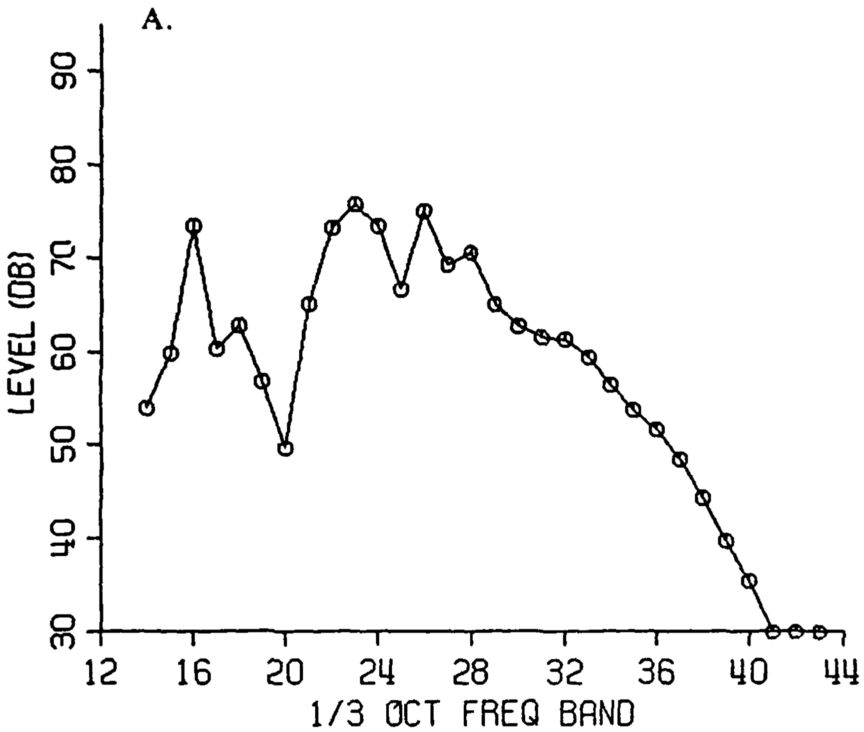


FIGURE C-K-1-3: EVENT AT28 - LEVEL FLYOVER - 07/26/91
ENSTROM TH28
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



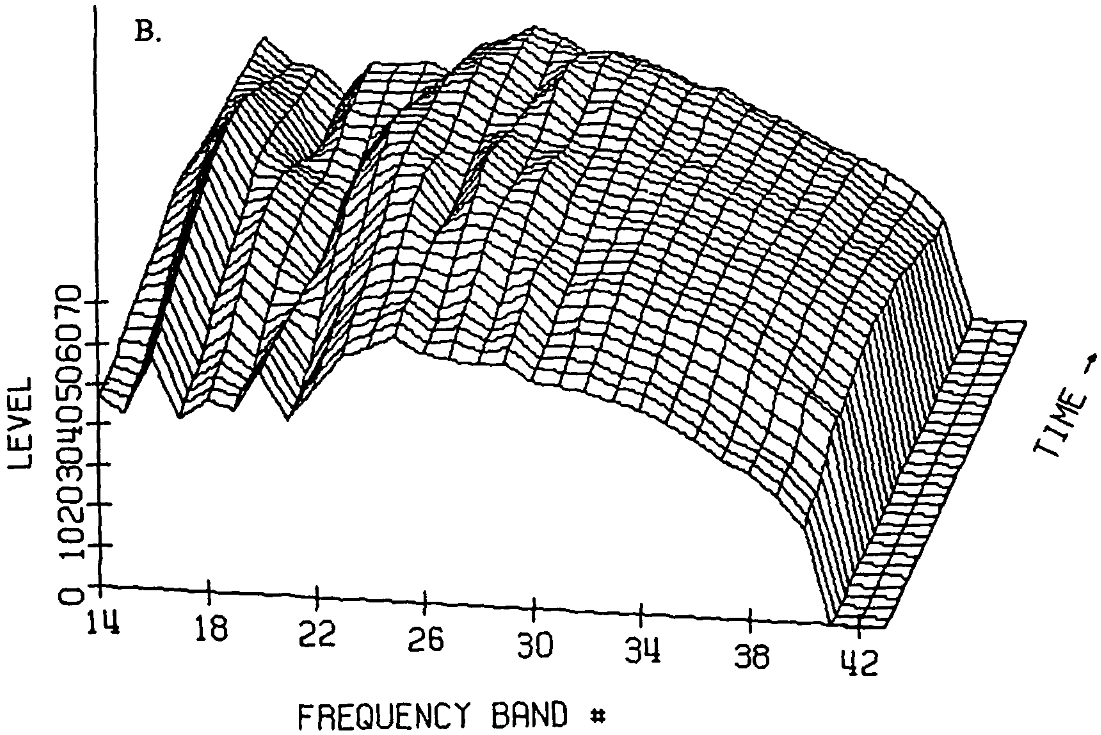
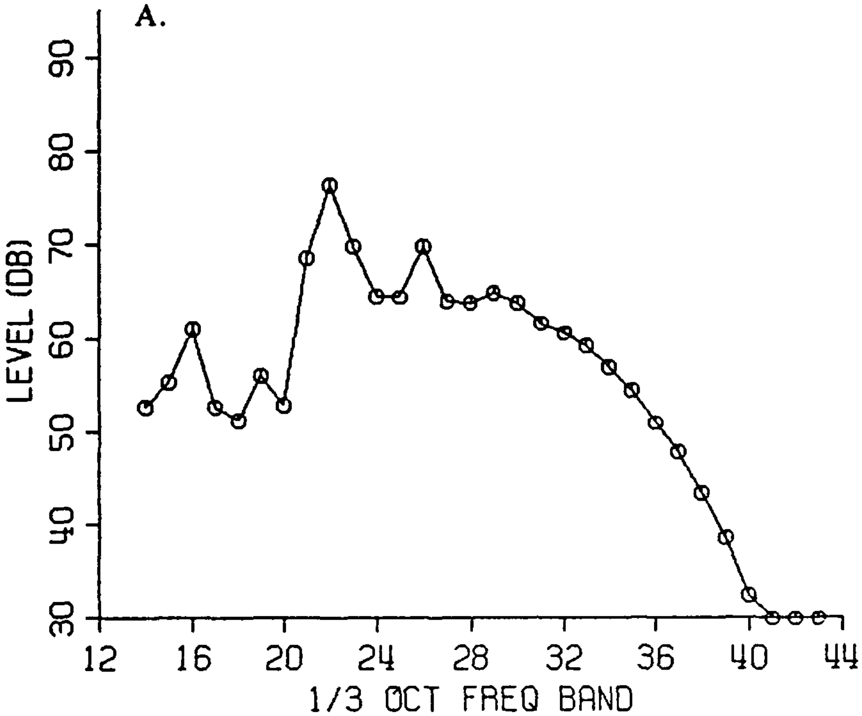


FIGURE C-K-2-1: EVENT BT7 - APPROACH - 07/26/91
ENSTROM TH28
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



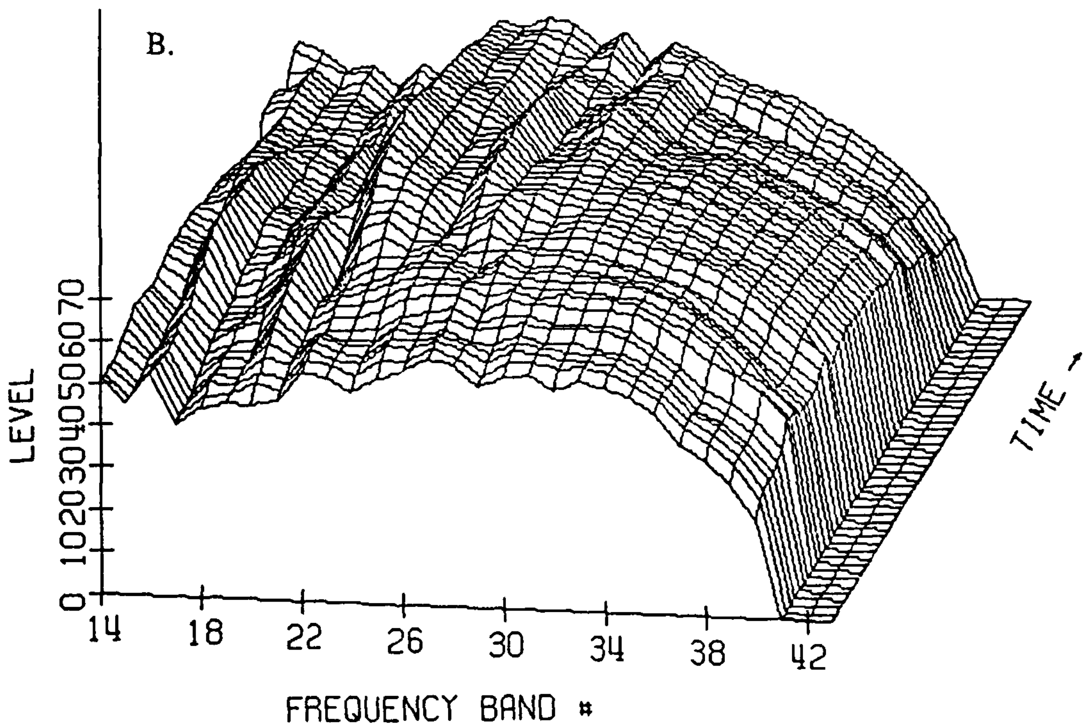
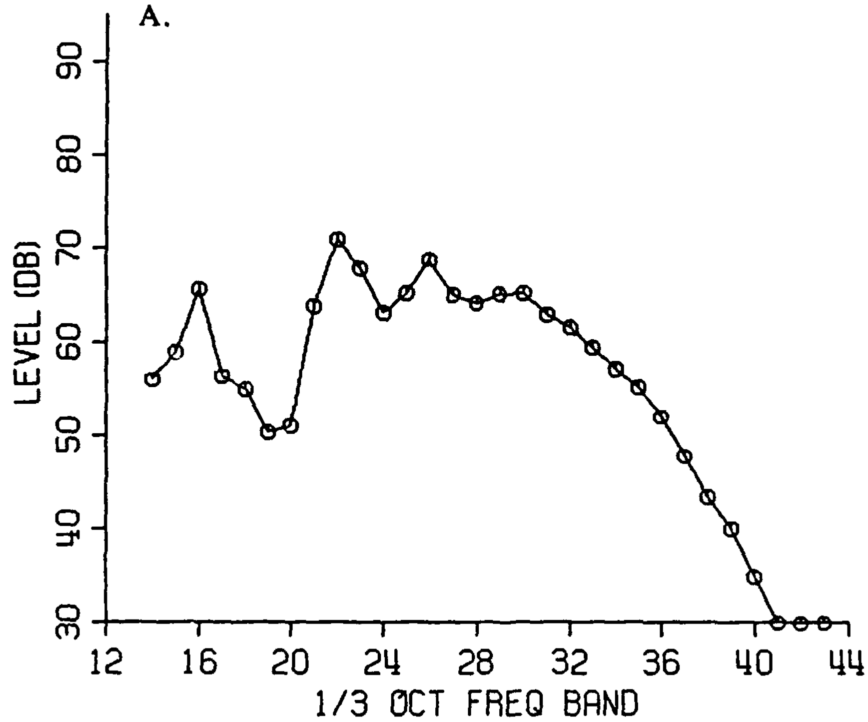


FIGURE C-K-2-2: EVENT CT19 - TAKEOFF - 07/26/91
ENSTROM TH28
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



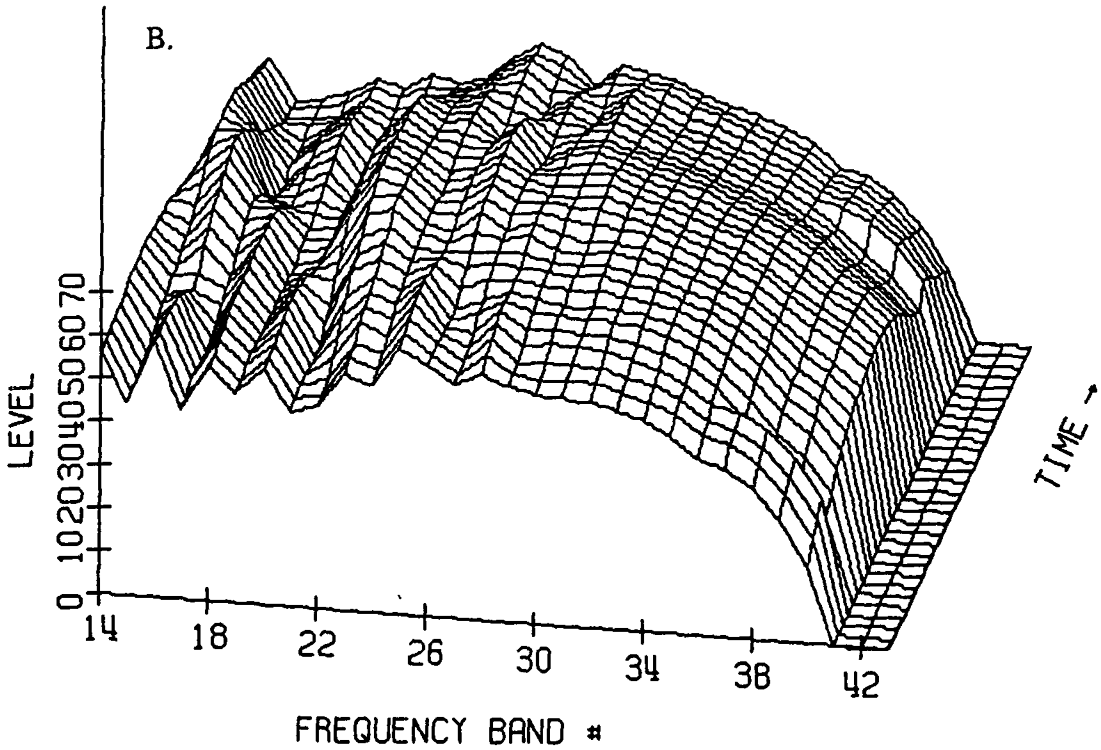
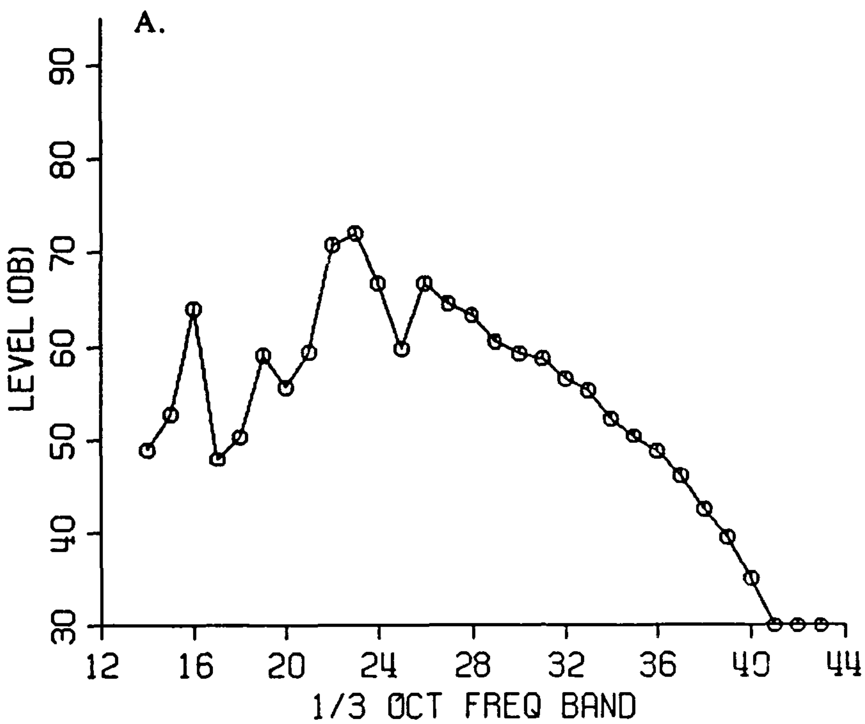


FIGURE C-K-2-3: EVENT AT28 - LEVEL FLYOVER - 07/26/91
ENSTROM TH28
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



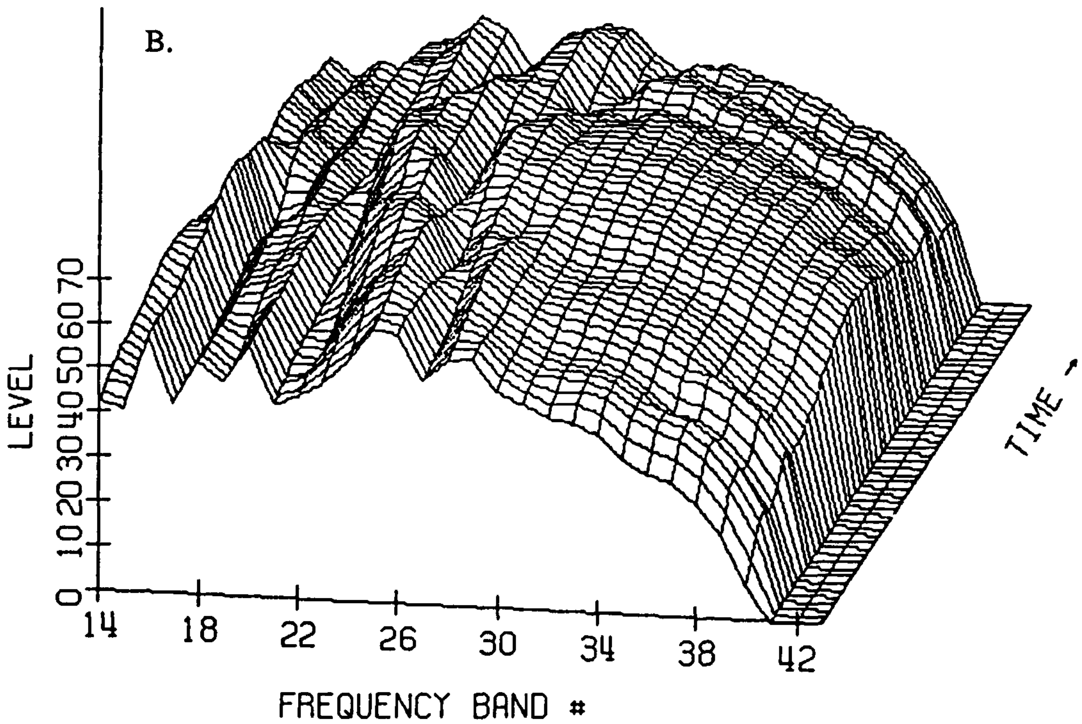
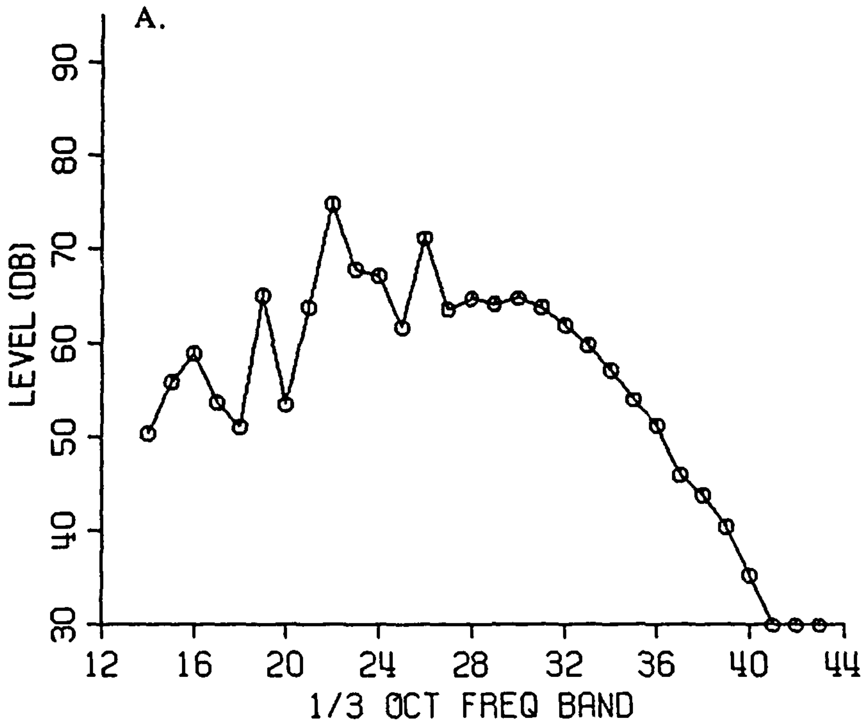


FIGURE C-K-3-1: EVENT BT7 - APPROACH - 07/26/91
ENSTROM TH28
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



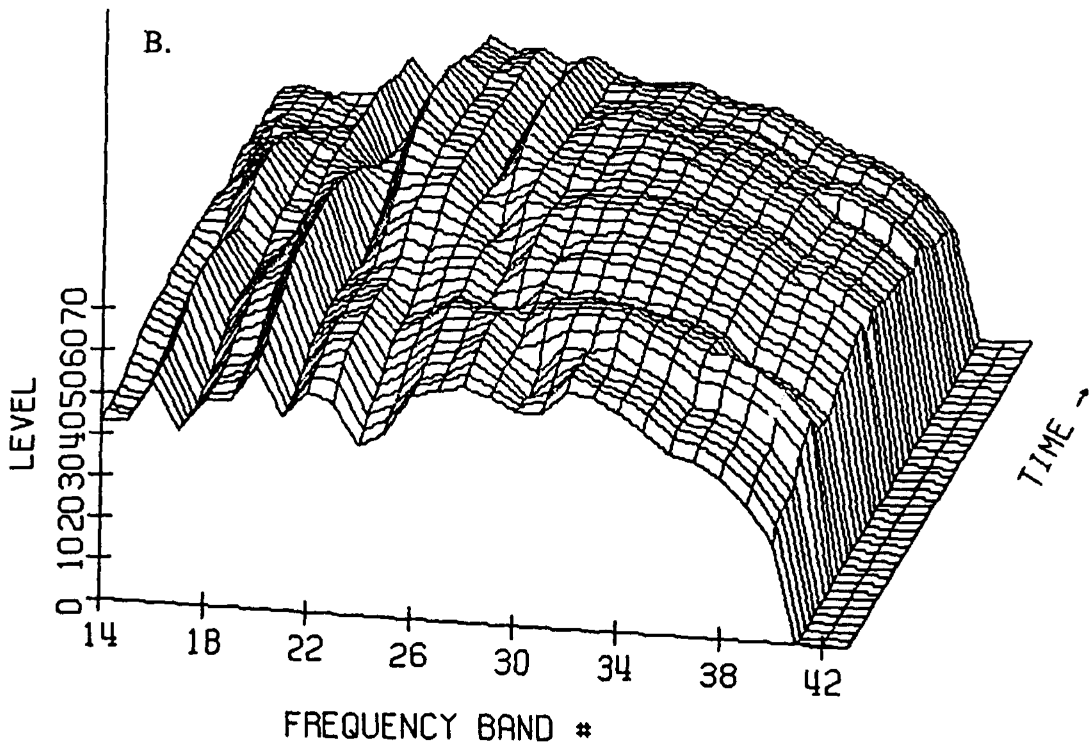
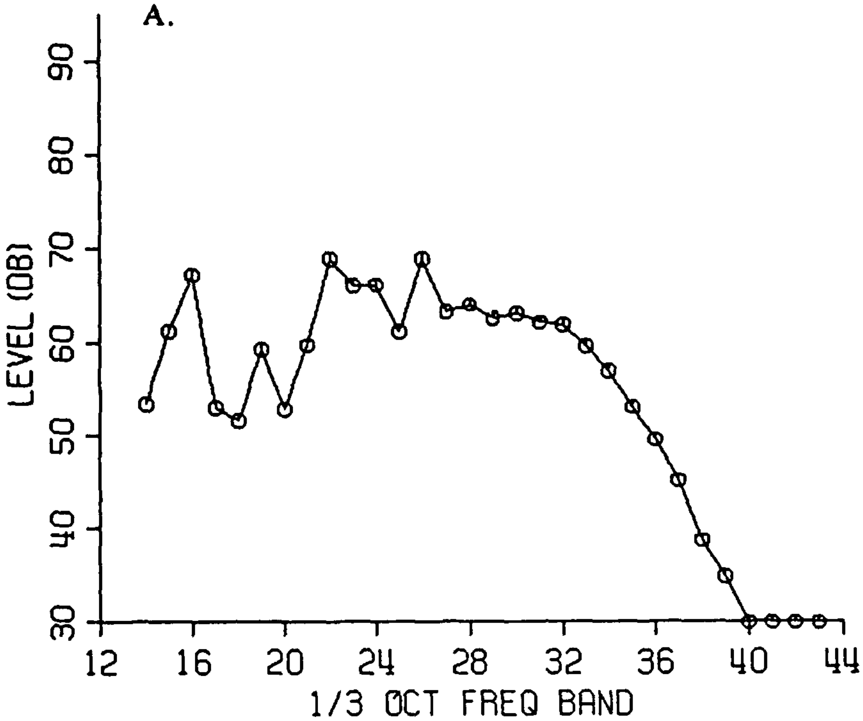


FIGURE C-K-3-2: EVENT CT19 - TAKEOFF - 07/26/91
ENSTROM TH28
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



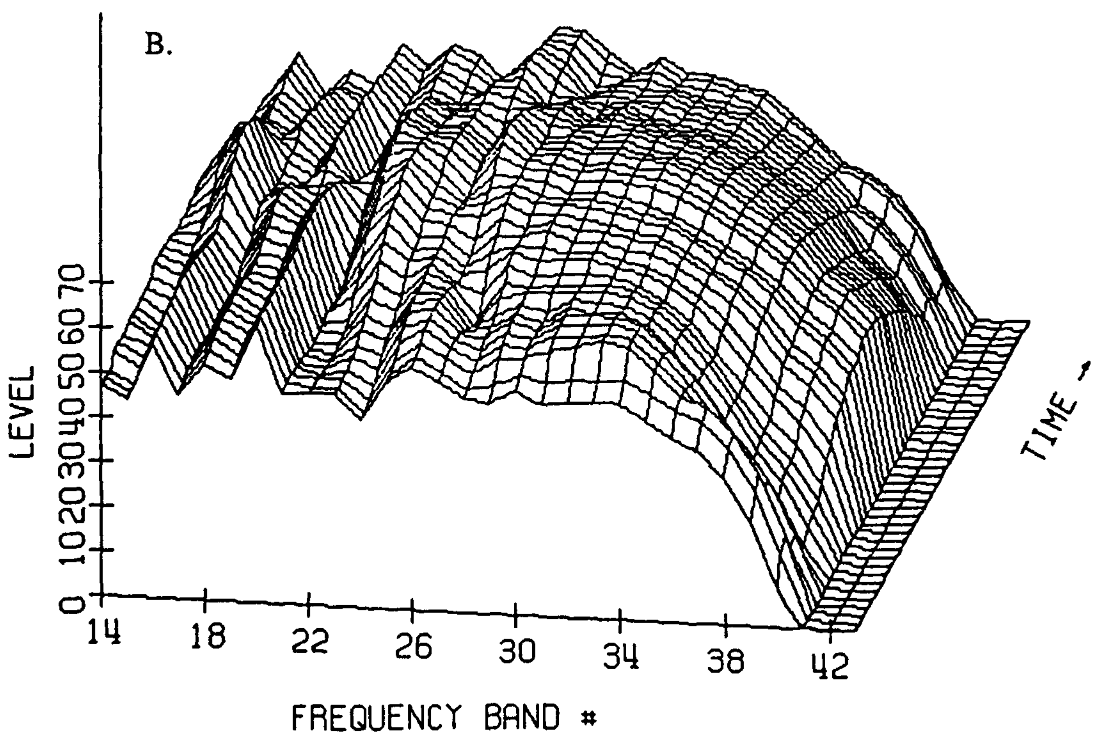
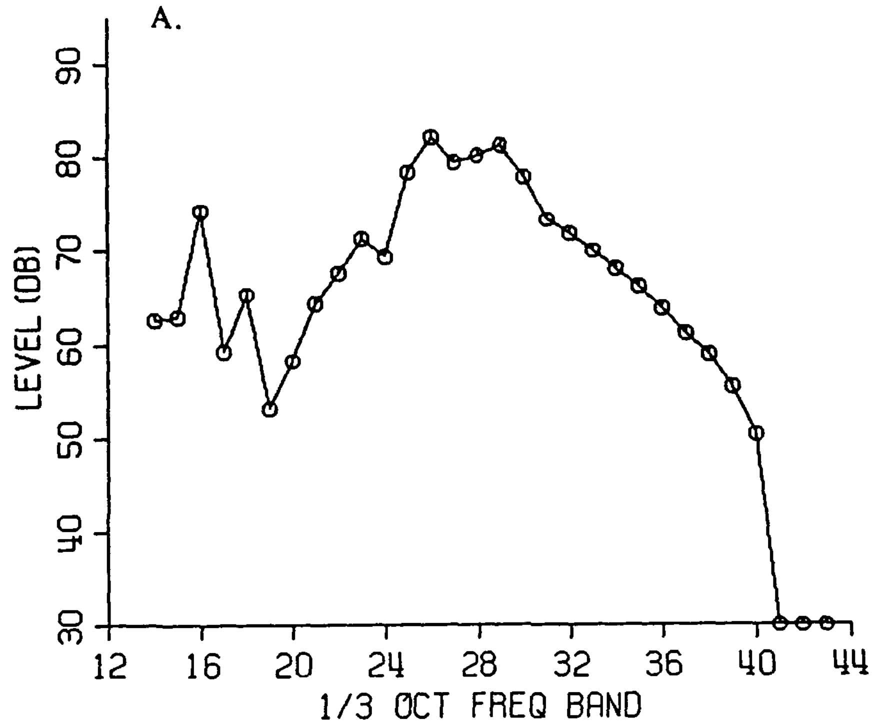


FIGURE C-K-3-3: EVENT AT28 - LEVEL FLYOVER - 07/26/91
ENSTROM TH28
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



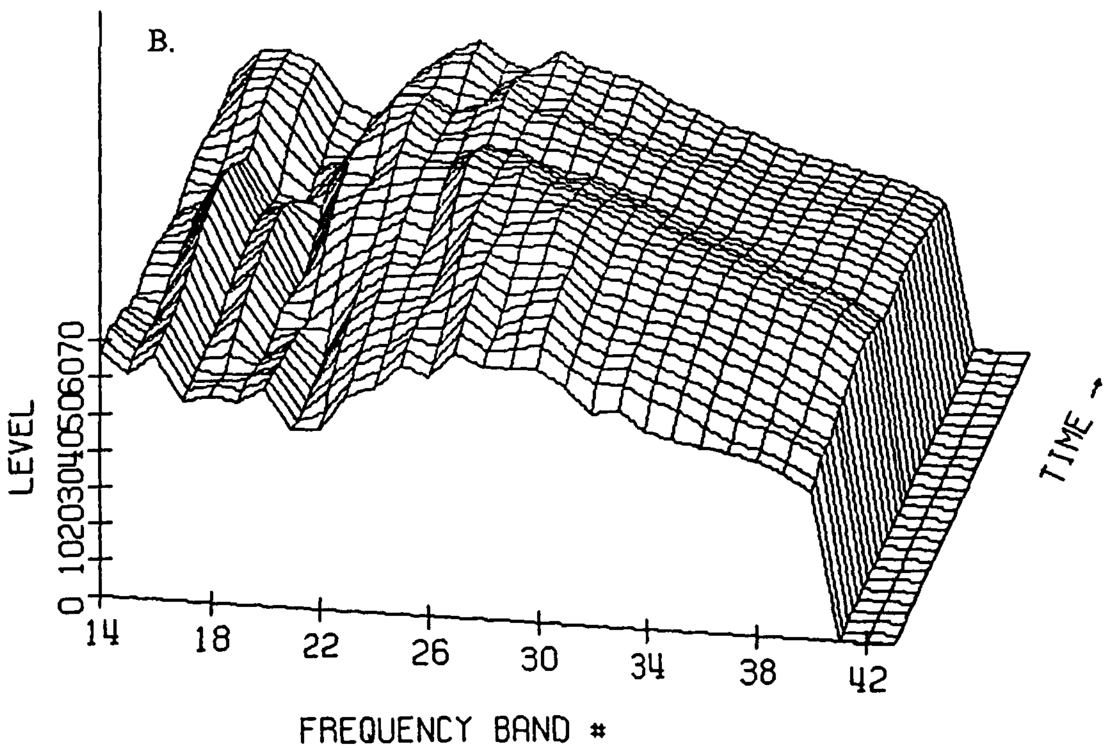
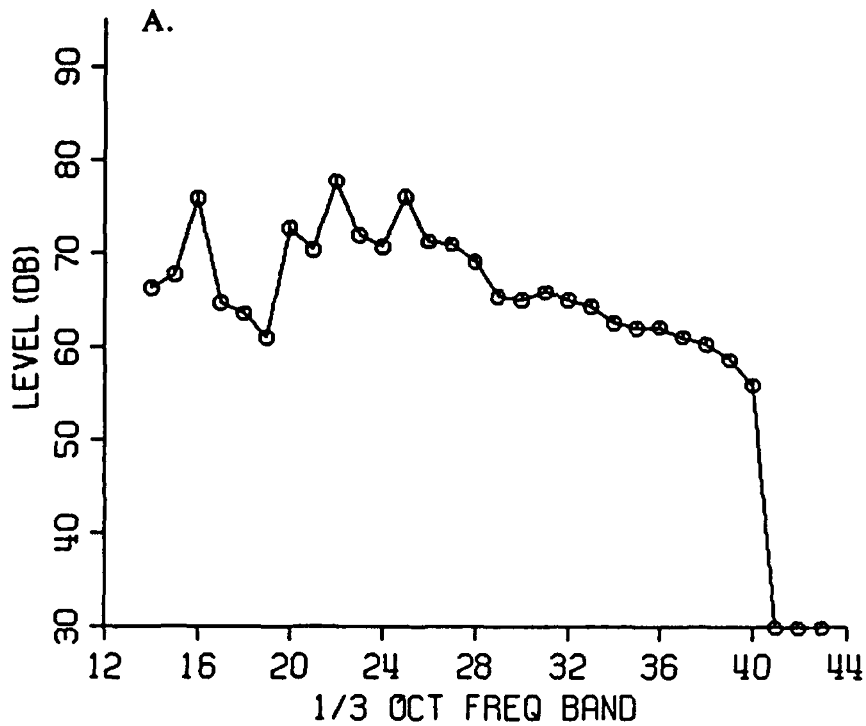


FIGURE C-L-1-1: EVENT B18 - APPROACH - 07/22/91
ROTORWAY EXEC 90
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



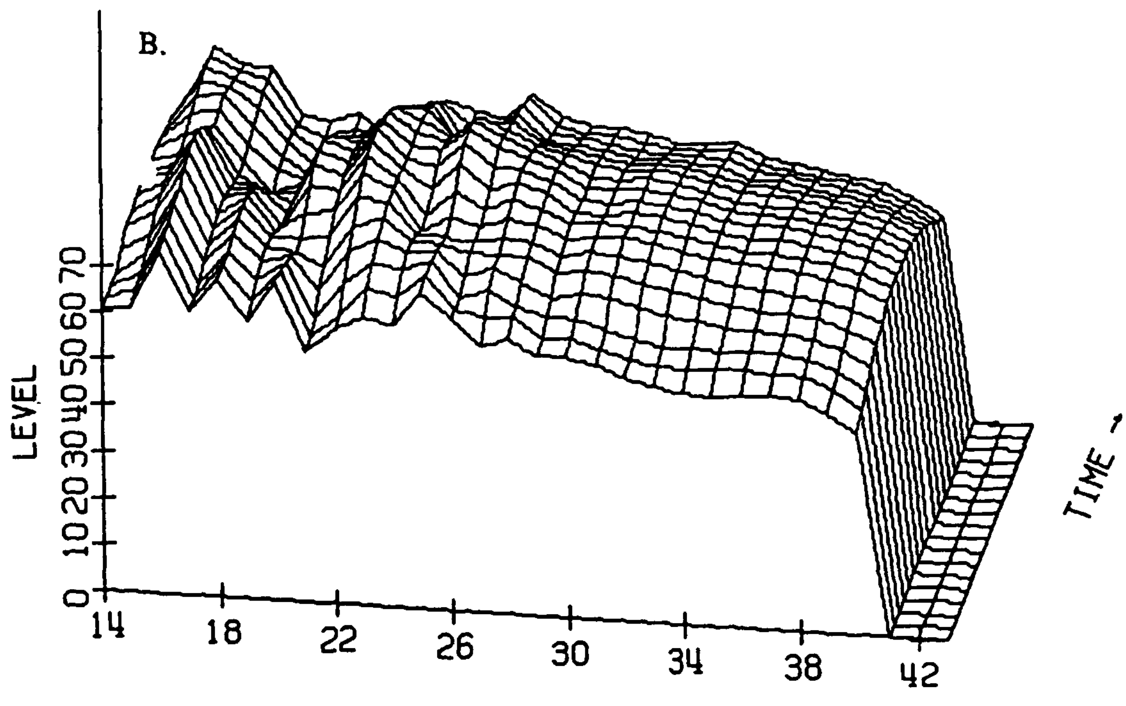
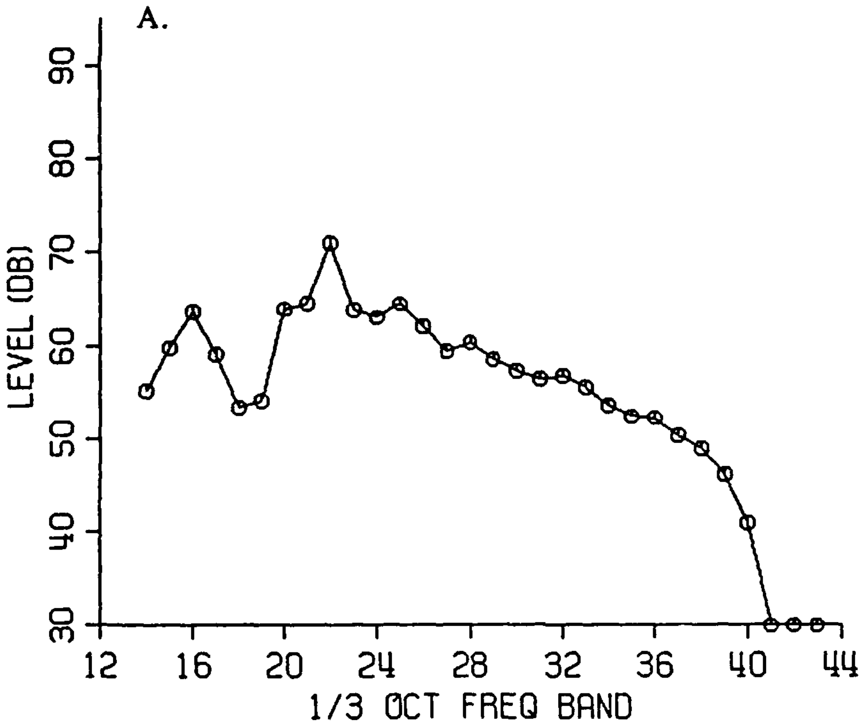


FIGURE C-L-1-2: EVENT C25 - TAKEOFF - 07/22/91
ROTORWAY EXEC 90
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



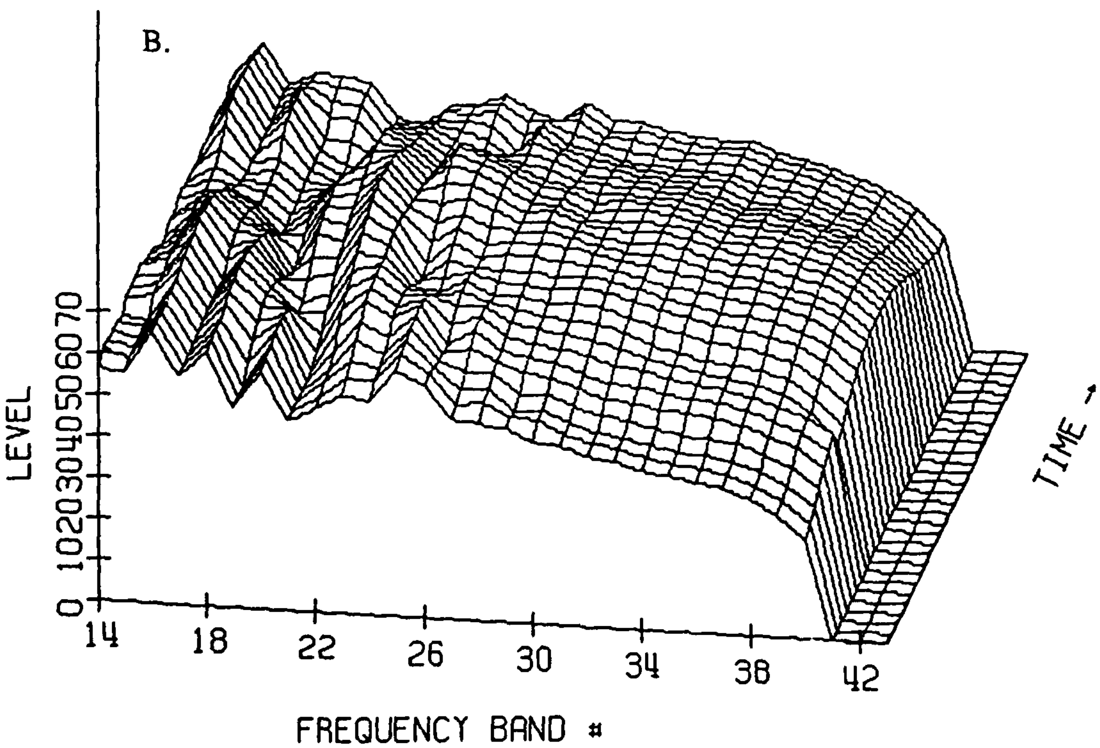
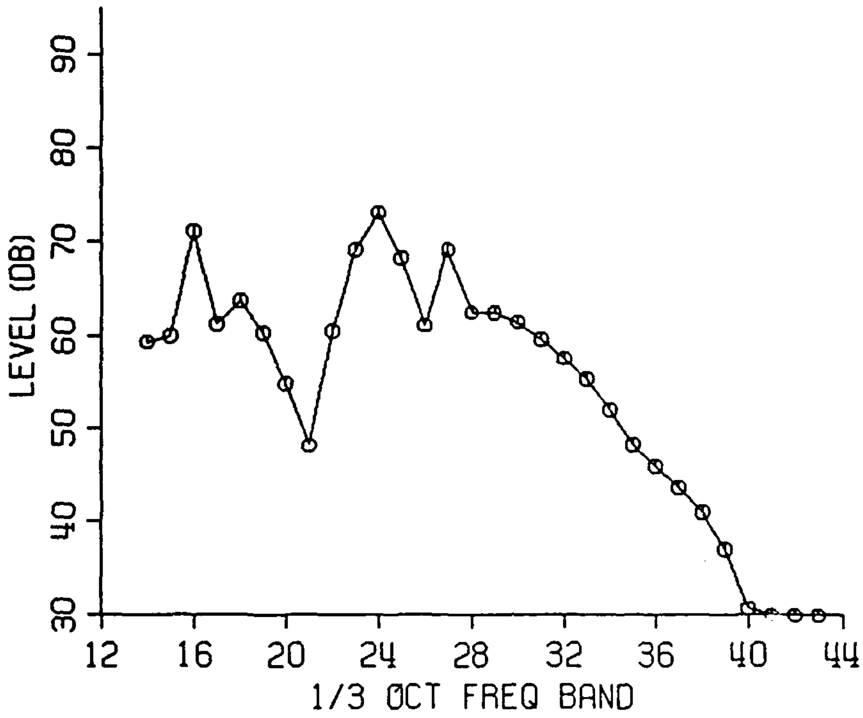


FIGURE C-L-1-3: EVENT A1 - LEVEL FLYOVER - 07/22/91
ROTORWAY EXEC 90
CENTERLINE CENTER - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

A.



B.

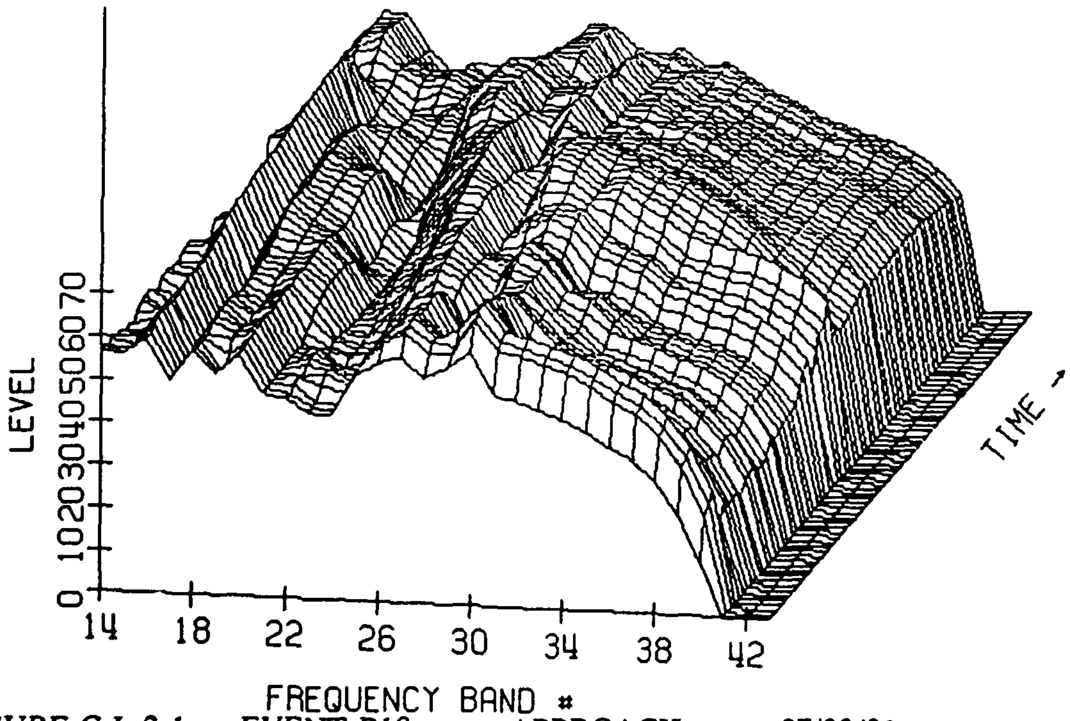
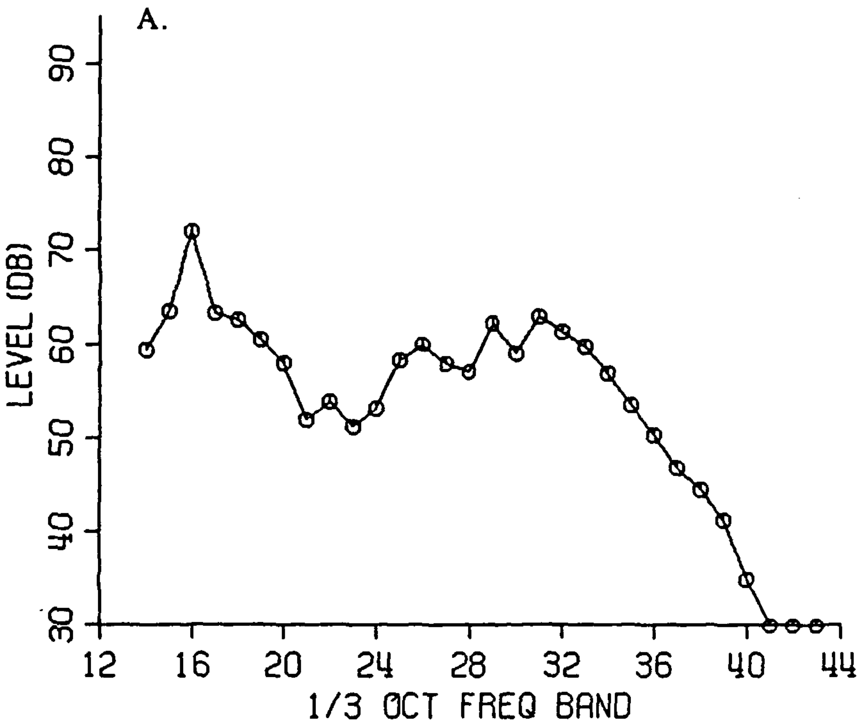


FIGURE C-L-2-1: EVENT B18 - APPROACH - 07/22/91
ROTORWAY EXEC 90
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



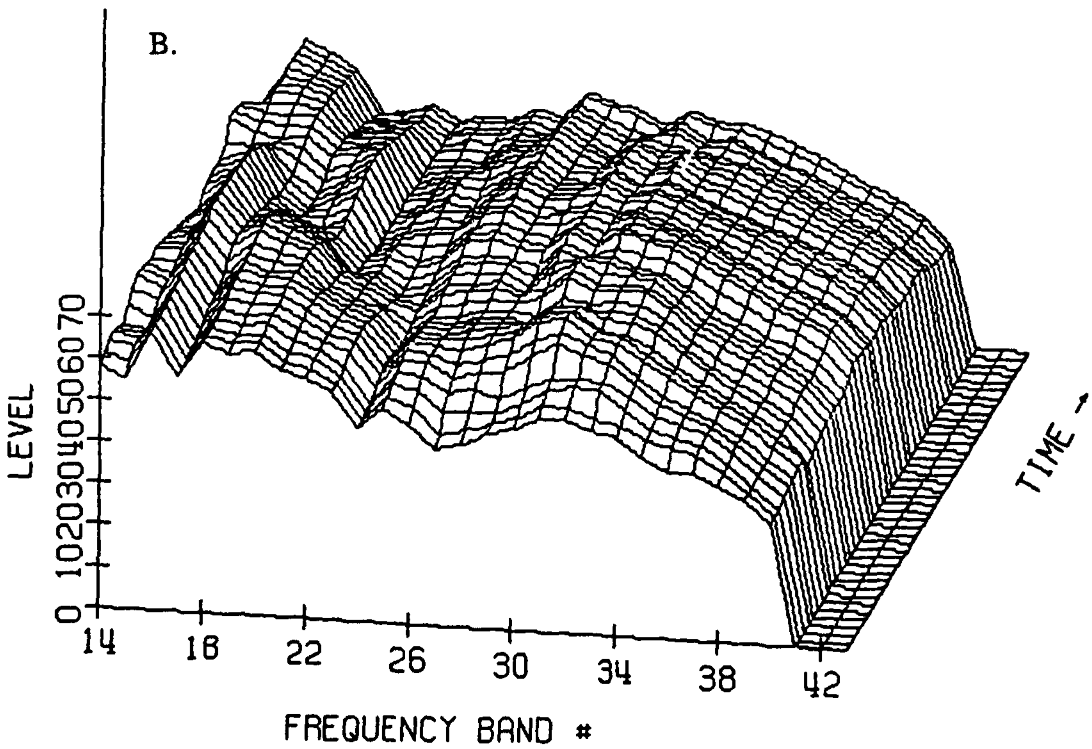
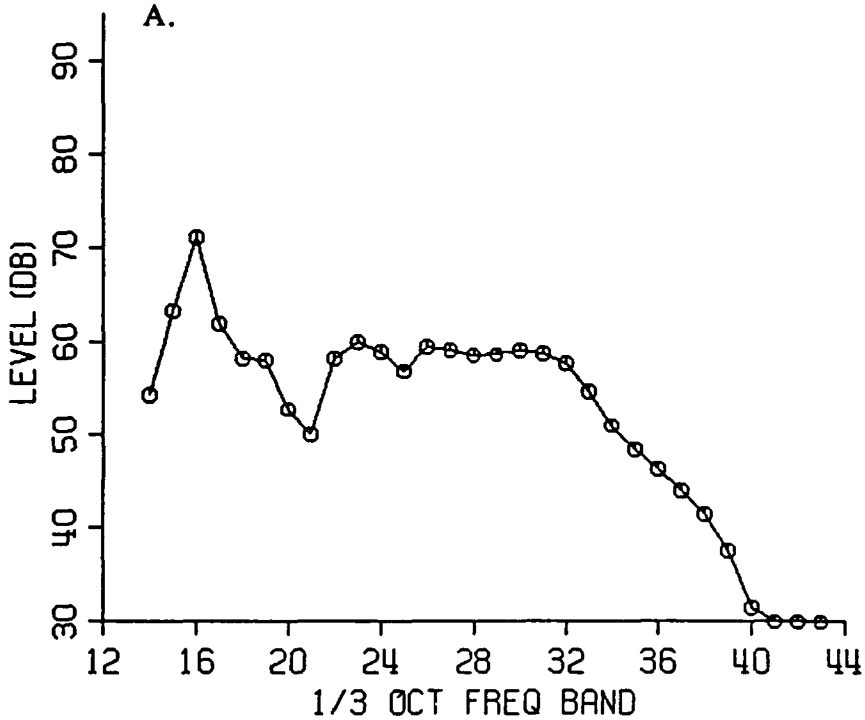


FIGURE C-L-2-2: EVENT C25 - TAKEOFF - 07/22/91
ROTORWAY EXEC 90
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



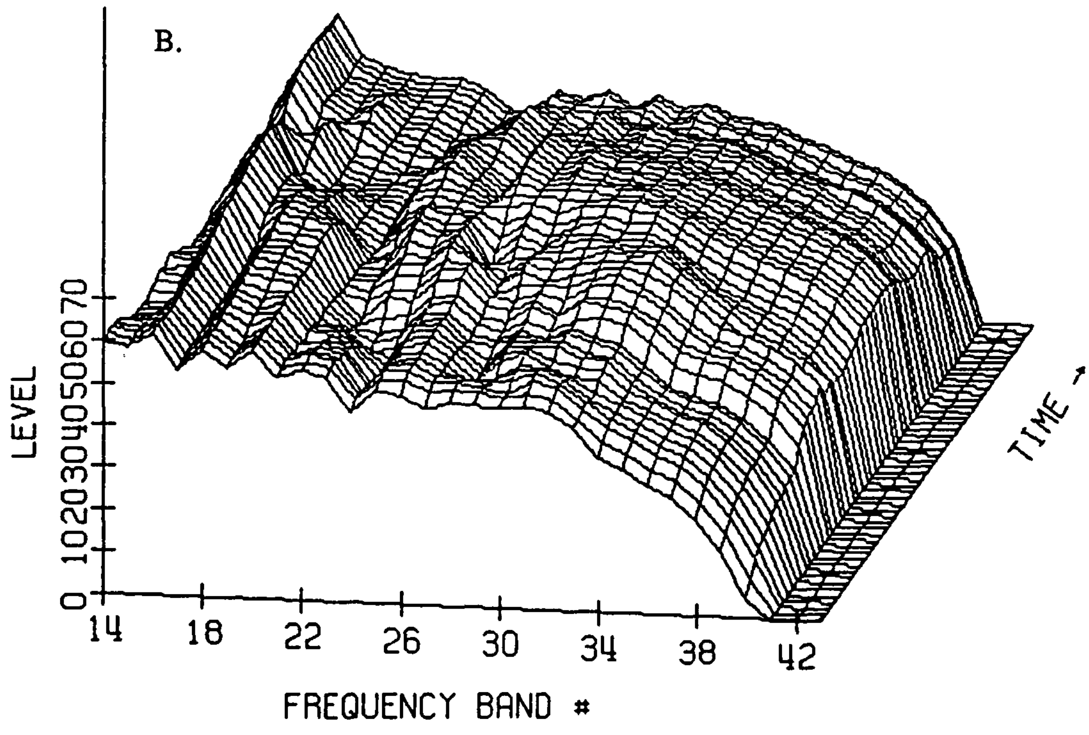
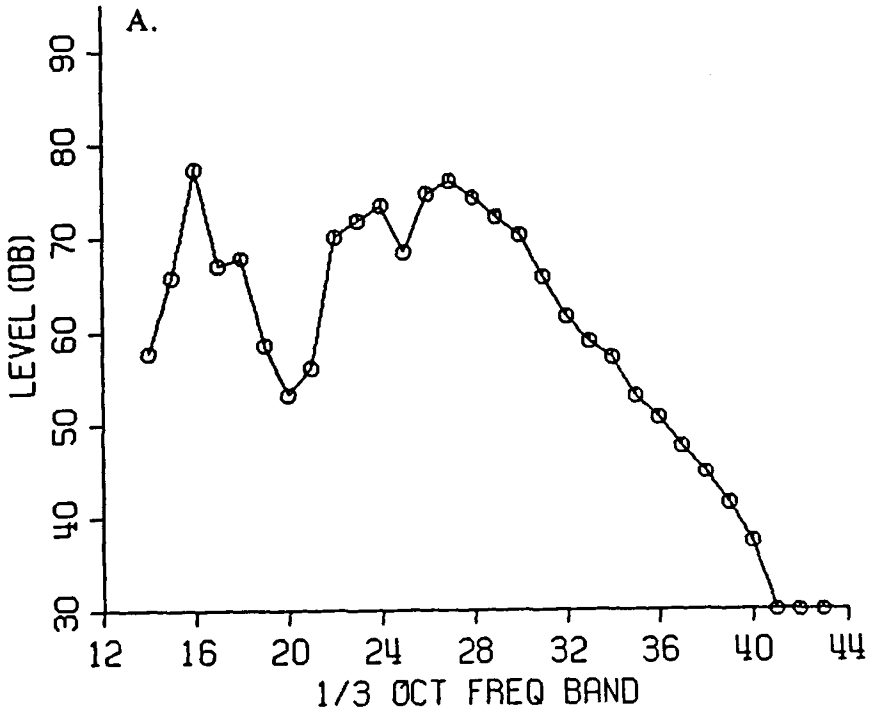


FIGURE C-L-2-3: EVENT A1 - LEVEL FLYOVER - 07/22/91
ROTORWAY EXEC 90
SIDELINE 150 m WEST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



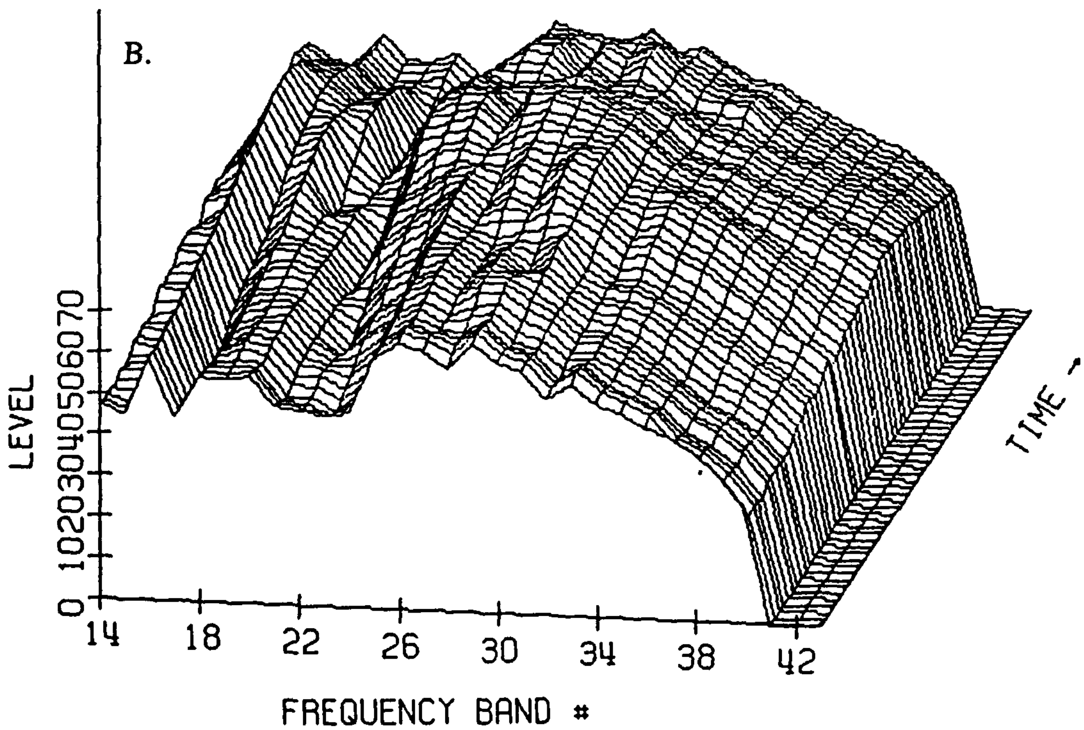
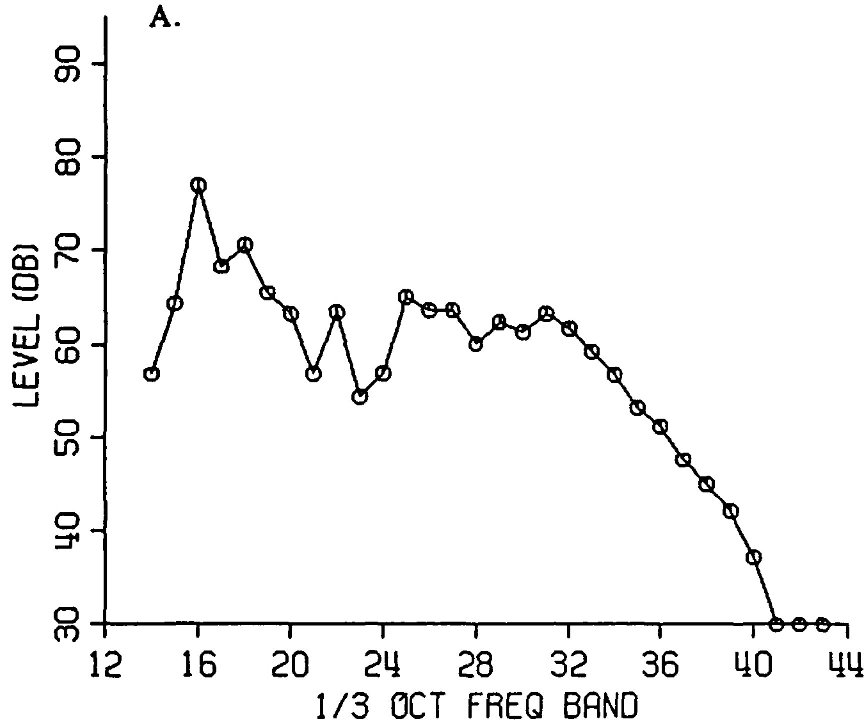


FIGURE C-L-3-1: EVENT B18 - APPROACH - 07/22/91
ROTORWAY EXEC 90
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY



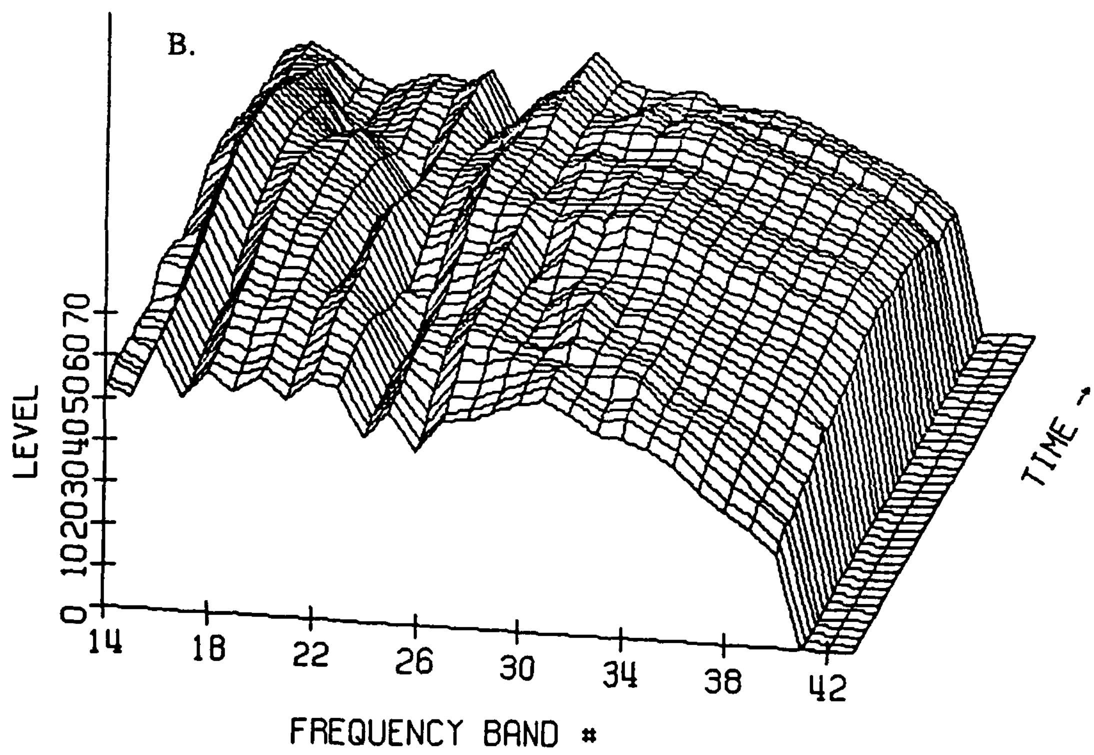


FIGURE C-L-3-2: EVENT C25 - TAKEOFF - 07/22/91
ROTORWAY EXEC 90
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

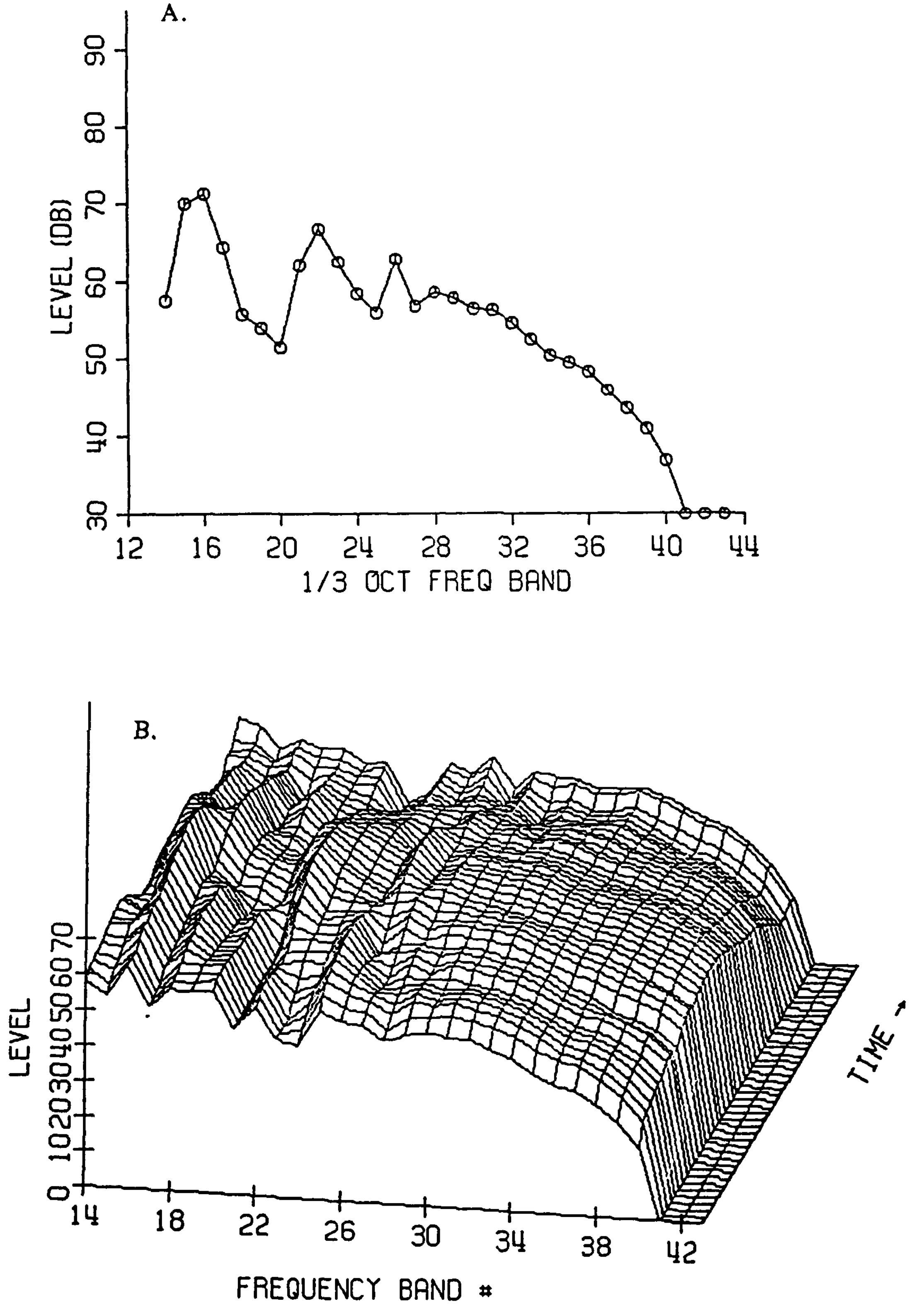


FIGURE C-L-3-3: EVENT A1 - LEVEL FLYOVER - 07/22/91
ROTORWAY EXEC 90
SIDELINE 150 m EAST - AS MEASURED

A. ONE THIRD OCTAVE SPECTRA AT PNLTm
B. ONE THIRD OCTAVE TIME HISTORY

APPENDIX D

SEL DATA COMPARISON

This Appendix presents a comparison of the sound exposure levels computed from: (1) the digitally recorded data (SEL), (2) the on-line data based on the field-estimated 10 to 15 dB down duration (SEL_1), and (3) the on-line data based on the exact 10 dB down duration (SEL_2), Tables D-A-1* through D-L-2.

*In the numerical notation for Table number, the first letter denotes Appendix, the second letter denotes helicopter configuration (as discussed in Section 1.4), and the first number differentiates between standard Far Part 36 tests (denoted by a 1) and additional flyover tests (denoted by a 2). For example, Table D-A-1 contains comparison of SEL values measured for helicopter Configuration A (Schweizer, Standard Configuration), subject to standard FAR Part 36 requirements.

TABLE D-A-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS — 07/22/91

	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
EV	SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
APPROACH -- TARGET IAS 40.8 kts									
B1	91.7	0.6	0.2	86.8	0.5	-0.1	85.4	0.6	0.1
B2	90.4	0.4	0.1	84.9	0.0	-0.4	85.7	0.7	0.2
B3	89.6	0.4	0.1	84.7	0.4	-0.4	84.8	0.6	-0.3
B4	88.8	0.6	0.1	83.9	0.4	-0.3	85.0	0.6	-0.4
B5	90.0	0.5	0.1	84.4	0.3	-0.3	85.0	0.8	0.1
B6	91.2	0.5	0.1	85.2	0.3	0.0	85.2	0.8	0.3
AVG	90.3	0.5	0.1	85.0	0.3	-0.3	85.2	0.7	-0.0
STD DV	1.1	0.1	0.1	1.0	0.2	0.2	0.3	0.1	0.3
TAKEOFF -- TARGET IAS 40.8 kts									
C1	91.8	0.4	0.0	87.9	0.3	-0.0	89.4	0.6	-0.2
C5	92.1	0.5	0.3	89.2	0.4	-0.1	88.8	0.5	0.1
C6	93.0	0.4	0.2	88.3	0.4	0.1	89.6	0.5	0.0
C7	91.8	0.3	0.3	88.3	0.2	-0.1	90.4	0.5	0.1
C8	91.7	0.6	-0.1	88.0	0.3	-0.3	89.7	0.5	0.1
C9	92.5	0.5	0.3	88.6	0.2	-0.1	89.3	0.4	0.1
AVG	92.1	0.5	0.1	88.4	0.3	-0.1	89.5	0.5	0.0
STD DV	0.5	0.1	0.2	0.5	0.1	0.1	0.5	0.1	0.1
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh									
A1	86.8	0.6	-0.2	83.7	0.3	-0.2	85.1	0.2	-0.4
A2	85.5	0.6	0.1	83.5	0.2	-0.1	84.5	0.2	-0.5
A3	86.9	0.4	0.0	83.8	0.4	-0.0	85.2	0.3	-1.0
A4	85.6	0.7	0.2	83.8	0.4	-0.1	84.8	0.2	-0.7
A5	86.3	0.6	0.1	84.4	0.3	-0.3	84.4	0.5	-0.1
A6	85.5	0.5	0.1	83.1	0.3	-0.4	85.2	0.2	-0.8
AVG	86.1	0.6	0.1	83.7	0.3	-0.2	84.9	0.3	-0.6
STD DV	0.6	0.1	0.1	0.4	0.1	0.2	0.4	0.1	0.3

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

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February 11, 1993

TABLE D-A-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
STOCK EXHAUST (NO MUFFLER)
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/22/91

EV	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
	SEL*	ΔSEL_1**	ΔSEL_2***	SEL	ΔSEL_1	ΔSEL_2	SEL	ΔSEL_1	ΔSEL_2
--	----	----	----	----	----	----	----	----	----
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh									
D1	87.1	0.5	0.1	84.9	0.5	0.1	85.8	0.6	0.2
D2	86.1	0.5	0.1	84.2	NO DATA		85.8	0.5	-0.0
AVG	86.6	0.5	0.1	84.6	0.5	0.1	85.8	0.6	0.1
STD DV	0.7	0.0	0.0	0.5	0.0	0.0	0.0	0.1	0.2
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh									
D5	86.1	0.3	-0.2	83.2	0.7	-0.0	84.8	0.6	-0.1
D6	85.7	0.4	-0.3	82.7	0.4	-0.4	84.3	0.7	0.1
AVG	85.9	0.4	-0.2	82.9	0.6	-0.2	84.5	0.7	0.0
STD DV	0.2	0.0	0.1	0.4	0.2	0.2	0.3	0.1	0.1
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh									
D7	86.1	0.2	0.0	83.7	0.4	-0.2	84.5	0.3	-0.0
D8	85.5	0.6	0.1	82.8	0.4	-0.2	84.9	0.7	-0.0
AVG	85.8	0.4	0.1	83.2	0.4	-0.2	84.7	0.5	-0.0
STD DV	0.4	0.2	0.0	0.6	0.0	0.0	0.3	0.2	0.0
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh									
D9	86.9	0.5	-0.0	83.8	0.5	-0.1	85.0	0.5	0.1
D10	86.6	0.1	-0.4	82.8	0.3	-0.4	85.5	0.7	-0.1
AVG	86.7	0.3	-0.2	83.3	0.4	-0.3	85.3	0.6	-0.0
STD DV	0.2	0.3	0.3	0.7	0.1	0.2	0.3	0.2	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA

** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)

*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

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TABLE D-B-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/22/91

EV	SITE 1 - CENTERLINE CENTER SEL* (dB)	ΔSEL$_1$** (dB)	ΔSEL$_2$*** (dB)	SITE 2 - SIDELINE 150 m WEST SEL (dB)	ΔSEL$_1$ (dB)	ΔSEL$_2$ (dB)	SITE 3 - SIDELINE 150 m EAST SEL (dB)	ΔSEL$_1$ (dB)	ΔSEL$_2$ (dB)
APPROACH -- TARGET IAS 40.8 kts									
B15	89.1	0.7	-0.3	84.4	0.4	0.1	83.9	0.4	-0.1
B16	90.3	0.6	0.1	85.6	0.6	0.0	85.2	0.3	-0.3
B17	87.7	0.4	0.2	83.4	0.5	-0.2	83.8	0.2	-0.1
B18	87.4	0.5	0.1	83.1	0.7	-0.2	84.0	0.2	-0.1
B19	88.1	0.5	0.1	83.4	0.6	-0.3	83.2	0.2	-0.0
B20	86.4	0.5	0.0	82.8	0.5	-0.2	82.8	0.6	-0.0
AVG	88.2	0.5	0.0	83.8	0.6	-0.1	83.8	0.3	-0.1
STD DV	1.4	0.1	0.2	1.0	0.1	0.1	0.8	0.2	0.1
TAKEOFF -- TARGET IAS 40.8 kts									
C21	85.1	0.6	0.2	83.4	0.4	-0.1	85.3	0.3	0.0
C23	84.9	0.8	-0.0	82.6	0.4	-0.1	84.7	0.9	0.4
C24	85.8	0.5	0.0	83.5	0.5	-0.0	85.1	0.3	0.1
C26	85.7	0.7	0.2	83.7	0.5	-0.1	85.1	NO DATA	
C27	86.2	0.6	0.2	83.5	NO DATA		85.9	-0.1	-0.4
C28	85.4	0.7	0.2	83.3	0.5	-0.0	84.6	0.1	-0.0
AVG	85.5	0.7	0.1	83.3	0.4	-0.1	85.1	0.2	0.0
STD DV	0.5	0.1	0.1	0.4	0.1	0.1	0.5	0.4	0.3
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh									
A1	79.8	0.5	-0.0	79.5	0.6	0.1	79.8	0.5	0.2
A2	79.3	0.5	-0.0	79.0	0.3	0.0	79.5	0.5	0.3
A3	80.7	0.5	0.1	80.0	0.7	0.0	80.0	0.3	0.0
A4	79.3	0.5	-0.2	79.0	0.4	-0.1	79.3	0.6	0.3
A5	79.8	0.6	0.1	79.6	0.7	0.1	79.7	0.6	0.4
A6	79.2	0.6	0.1	78.4	0.6	-0.0	78.8	0.8	0.3
AVG	79.7	0.5	0.0	79.3	0.5	-0.0	79.5	0.6	0.2
STD DV	0.6	0.1	0.1	0.6	0.2	0.1	0.4	0.1	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

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February 11, 1993

TABLE D-B-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER - STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/22/91

	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
EV	SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh									
D7	80.2	0.9	0.1	80.6	0.4	-0.2	80.8	0.2	0.0
D8	80.4	0.5	0.1	80.5	0.5	0.1	79.6	0.5	-0.1
AVG	80.3	0.7	0.1	80.6	0.4	-0.1	80.2	0.3	-0.0
STD DV	0.2	0.3	0.0	0.1	0.1	0.2	0.8	0.3	0.1
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh									
D9	80.5	0.5	0.1	79.7	0.7	0.1	79.8	0.5	0.1
D10	79.6	0.5	0.1	78.4	0.7	0.1	79.1	0.5	0.2
AVG	80.1	0.5	0.1	79.0	0.7	0.1	79.5	0.5	0.1
STD DV	0.6	0.0	0.0	0.9	0.1	0.1	0.5	0.0	0.0
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh									
D11	80.9	0.3	0.0	79.5	0.7	-0.0	80.2	0.4	-0.1
D12	79.4	0.5	0.0	78.5	0.3	-0.2	78.3	0.6	0.1
AVG	80.1	0.4	0.0	79.0	0.5	-0.1	79.2	0.5	0.0
STD DV	1.1	0.1	0.0	0.8	0.2	0.1	1.4	0.2	0.2
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh									
D13	82.7	0.6	0.1	81.2	0.3	-0.3	81.9	0.2	-0.1
D14	80.0	0.4	-0.0	78.2	0.5	-0.4	78.6	0.6	0.2
AVG	81.4	0.5	0.0	79.7	0.4	-0.4	80.2	0.4	0.1
STD DV	1.9	0.1	0.1	2.1	0.2	0.0	2.3	0.3	0.2

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA

** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)

*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

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February 11, 1993

TABLE D-C-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR
(25% RPM REDUCTION)

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/23/91

EV	SITE 1 - CENTERLINE CENTER SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SITE 2 - SIDELINE 150 m WEST SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SITE 3 - SIDELINE 150 m EAST SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
APPROACH -- TARGET IAS 40.8 kts									
B18	90.7	0.9	0.4	84.3	0.8	-0.4	81.9	0.5	0.1
B20	90.2	0.7	0.3	85.6	0.5	-0.3	81.8	0.5	0.2
B21	89.9	0.8	0.4	83.7	0.9	-0.1	81.0	0.4	-0.1
B22	88.9	0.9	0.4	85.4	0.6	-0.2	81.5	1.3	-0.1
B23	89.0	0.6	0.4	84.1	0.2	-0.3	81.6	0.3	0.2
B24	89.7	0.6	0.4	84.9	0.3	-0.0	80.6	0.4	-0.0
AVG	89.7	0.8	0.4	84.7	0.5	-0.2	81.4	0.6	0.0
STD DV	0.7	0.2	0.1	0.8	0.3	0.2	0.5	0.4	0.2
TAKEOFF -- TARGET IAS 40.8 kts									
C25	82.7	0.4	0.1	79.2	0.4	-0.2	81.8	0.2	0.1
C26	83.2	0.4	0.2	80.0	0.2	-0.2	81.8	0.4	0.1
C27	83.6	0.4	0.2	80.5	-0.1	-0.2	82.0	0.2	0.0
C28	83.7	0.5	0.2	80.6	0.0	-0.3	82.0	0.3	-0.1
C29	83.0	0.5	0.2	79.6	0.2	-0.2	82.0	0.1	0.1
C30	83.8	0.4	0.2	80.7	0.3	-0.4	83.7	0.3	0.1
AVG	83.2	0.4	0.2	80.0	0.1	-0.2	81.9	0.2	0.0
STD DV	0.4	0.1	0.0	0.6	0.2	0.0	0.1	0.1	0.1
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh									
A1	77.9	0.3	-0.0	77.2	0.1	-0.5	77.5	0.4	0.1
A2	79.2	0.5	0.1	78.1	0.3	-0.3	78.8	0.5	0.1
A3	77.6	0.5	0.1	76.9	0.3	-0.4	76.8	0.6	-0.2
A4	79.4	0.3	-0.7	78.2	0.4	-0.2	78.1	1.0	0.1
A5	78.1	0.4	-0.4	76.9	0.4	-0.2	77.0	0.5	0.1
A7	79.8	0.4	-0.1	78.6	0.2	-0.4	79.2	NO DATA	
AVG	78.7	0.4	-0.2	77.6	0.3	-0.3	77.9	0.6	0.0
STD DV	0.9	0.1	0.3	0.7	0.1	0.1	1.0	0.2	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA

** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)

*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

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TABLE D-C-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SEL COMPARISON ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/23/91

	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
EV	SEL*	ΔSEL_1**	ΔSEL_2***	SEL	ΔSEL_1	ΔSEL_2	SEL	ΔSEL_1	ΔSEL_2
--	----	----	----	----	----	----	----	----	----
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh									
D8	78.4	0.5	0.1	77.8	0.5	-0.4	78.2	0.3	-0.1
D9	79.7	0.8	0.4	79.6	0.1	-0.4	80.1	0.3	-0.7
AVG	79.1	0.6	0.2	78.7	0.3	-0.4	79.2	0.3	-0.4
STD DV	0.9	0.2	0.2	1.2	0.2	0.0	1.4	0.0	0.5
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh									
D10	77.8	0.9	0.2	76.8	0.0	-0.4	76.9	0.4	0.1
D11	79.3	0.7	0.1	77.8	0.1	-0.7	78.8	0.3	-0.3
AVG	78.6	0.8	0.1	77.3	0.1	-0.5	77.9	0.3	-0.1
STD DV	1.0	0.1	0.1	0.7	0.0	0.2	1.4	0.1	0.3
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh									
D12	77.7	0.8	0.4	77.2	0.1	-0.4	76.6	0.7	0.0
D13	79.5	0.7	0.3	77.3	0.2	-0.9	78.0	0.4	0.2
AVG	78.6	0.7	0.3	77.2	0.2	-0.6	77.3	0.6	0.1
STD DV	1.3	0.1	0.1	0.1	0.0	0.4	1.0	0.2	0.1
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh									
D14	78.3	0.7	0.2	76.7	0.3	-0.5	76.7	0.3	0.1
D16	80.4	0.6	-0.0	78.6	0.8	-0.5	79.4	0.2	-0.8
AVG	79.3	0.7	0.1	77.6	0.6	-0.5	78.0	0.3	-0.3
STD DV	1.5	0.1	0.1	1.3	0.4	0.0	1.9	0.1	0.6

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1$-SEL (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2$-SEL (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

TABLE D-D-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SEL COMPARISON ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/23/91

EV	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
	SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
APPROACH -- TARGET IAS 40.8 kts									
B16	90.3	0.8	0.5	85.2	0.7	0.4	82.8	0.1	0.0
B17	91.4	0.6	0.4	86.2	0.9	0.3	83.2	0.2	0.1
B18	91.1	0.6	0.4	85.3	0.8	0.4	82.6	0.4	0.1
B20	88.1	0.6	0.3	82.0	1.1	0.5	82.7	0.2	0.0
B21	86.6	0.7	0.3	81.6	0.9	0.4	81.7	0.3	0.1
B22	88.8	0.6	0.3	82.4	0.8	0.3	81.9	0.4	0.0
AVG	89.4	0.6	0.4	83.8	0.9	0.4	82.5	0.3	0.1
STD DV	1.9	0.1	0.1	2.0	0.1	0.1	0.6	0.1	0.1
TAKEOFF -- TARGET IAS 40.8 kts									
C24	82.7	0.4	0.1	78.7	0.6	0.1	81.4	0.2	0.0
C25	81.7	0.3	0.1	78.3	0.6	0.2	81.1	0.2	0.1
C26	82.7	0.3	0.1	77.9	0.4	0.1	81.2	0.4	0.2
C27	82.6	0.4	0.1	79.1	0.4	0.2	81.1	0.3	0.1
C28	82.4	0.3	0.1	78.6	0.6	0.3	81.5	0.1	-0.0
C29	82.2	0.2	0.0	78.5	0.6	0.3	81.0	0.1	-0.1
AVG	82.4	0.3	0.1	78.5	0.5	0.2	81.2	0.2	0.0
STD DV	0.4	0.1	0.0	0.4	0.1	0.1	0.2	0.1	0.1
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh									
A1	76.1	0.7	0.1	73.9	0.3	0.2	75.3	0.4	-0.1
A2	77.8	0.8	0.4	77.0	0.5	0.1	76.0	0.3	0.2
A3	75.5	1.1	0.2	74.4	0.3	0.1	75.8	0.4	0.2
A4	76.0	0.8	0.3	75.7	0.6	0.3	75.7	0.3	0.2
A5	76.2	0.7	0.5	74.7	0.6	0.2	75.8	0.4	0.2
A6	77.1	0.8	0.4	76.2	0.6	0.2	75.0	0.2	0.1
AVG	76.5	0.8	0.3	75.3	0.5	0.2	75.6	0.3	0.1
STD DV	0.9	0.1	0.1	1.2	0.1	0.1	0.4	0.1	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

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Acoustics Facility

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TABLE D-D-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST 4-BLADE 51" DIA. TAIL ROTOR (25% RPM REDUCTION)

SEL COMPARISON ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/23/91

	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
EV	SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh									
D7	77.3	0.8	0.2	75.4	0.7	0.1	76.2	0.3	0.1
D9	78.2	0.5	0.2	77.6	0.4	0.1	76.8	0.5	0.1
AVG	77.7	0.7	0.2	76.5	0.6	0.1	76.5	0.4	0.1
STD DV	0.6	0.2	0.0	1.6	0.2	0.0	0.5	0.1	0.0
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.8Vh									
D10	75.5	0.8	0.2	74.3	0.5	0.1	75.3	0.2	-0.1
D11	77.0	0.5	-0.0	75.8	0.4	0.3	76.2	0.0	-0.2
AVG	76.3	0.6	0.1	75.1	0.4	0.2	75.7	0.1	-0.2
STD DV	1.1	0.2	0.1	1.1	0.1	0.1	0.7	0.1	0.0
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.7Vh									
D12	76.9	0.6	-0.1	74.3	0.2	-0.0	75.4	0.3	0.1
D13	77.7	0.4	0.1	76.4	0.5	0.1	76.4	0.1	-0.2
AVG	77.3	0.5	0.0	75.4	0.3	0.0	75.9	0.2	-0.0
STD DV	0.6	0.1	0.1	1.5	0.2	0.1	0.7	0.1	0.2
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.6Vh									
D14	76.6	0.6	0.2	75.0	0.5	0.3	76.1	0.4	0.1
D15	78.7	0.5	0.2	77.3	0.5	0.2	76.9	0.2	0.1
AVG	77.7	0.5	0.2	76.2	0.5	0.3	76.5	0.3	0.1
STD DV	1.5	0.1	0.0	1.6	0.0	0.0	0.6	0.1	0.0

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

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TABLE D-E-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER
2-BLADE 46" DIA. TAIL ROTOR

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS — 07/24/91

EV	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
	SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
APPROACH -- TARGET IAS 40.8 kts									
B15	87.1	0.7	0.1	82.8	0.5	-0.0	83.5	0.2	-0.0
B16	84.9	0.6	-0.5	81.3	0.2	0.1	82.0	0.1	-0.1
B17	86.0	0.4	0.0	81.0	0.7	0.1	82.5	0.4	-0.0
B18	87.1	0.4	0.0	81.9	0.5	0.2	82.8	0.4	0.1
B19	88.3	0.5	0.2	82.9	0.7	0.3	83.3	0.3	0.1
B20	91.6	0.4	0.0	84.8	0.7	0.3	84.1	0.2	-0.1
AVG	87.5	0.5	-0.0	82.4	0.5	0.2	83.0	0.3	-0.0
STD DV	2.3	0.1	0.3	1.4	0.2	0.1	0.8	0.1	0.1
TAKEOFF -- TARGET IAS 40.8 kts									
E1	83.1	0.4	-0.2	81.1	0.2	-0.0	82.4	0.2	-0.2
E2	84.1	0.4	0.1	81.5	0.3	-0.0	82.9	0.3	0.2
E3	83.7	0.4	0.0	82.0	0.2	0.0	82.9	0.3	0.1
E5	83.9	0.4	0.1	81.6	0.2	-0.0	83.2	0.2	0.0
E6	83.8	0.4	0.0	81.6	0.2	0.1	83.0	0.4	0.1
E7	83.8	0.4	-0.0	81.4	0.2	-0.0	82.9	0.5	0.2
AVG	83.7	0.4	0.0	81.5	0.2	-0.0	82.9	0.3	0.1
STD DV	0.4	0.0	0.1	0.3	0.0	0.0	0.3	0.1	0.1
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh									
A1	79.1	0.5	-0.1	79.3	0.4	-0.0	78.9	0.2	-0.1
A2	80.5	0.3	-0.4	80.1	0.6	0.2	80.5	0.0	-0.2
A3	79.5	0.2	-0.8	78.8	0.5	0.1	79.0	0.1	-0.1
A4	80.4	0.6	-0.1	80.5	0.6	0.1	80.4	0.2	-0.1
A5	79.0	0.1	-0.7	79.1	0.4	0.0	78.5	0.3	-0.1
A6	80.9	0.4	-0.1	80.5	0.7	0.2	81.0	0.1	-0.2
AVG	79.9	0.4	-0.4	79.7	0.5	0.1	79.7	0.1	-0.1
STD DV	0.8	0.2	0.3	0.8	0.1	0.1	1.0	0.1	0.0

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

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TABLE D-E-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER 2-BLADE 46" DIA. TAIL ROTOR

SEL COMPARISON ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/24/91

EV	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
	SEL*	ΔSEL$_1$**	ΔSEL$_2$***	SEL	ΔSEL$_1$	ΔSEL$_2$	SEL	ΔSEL$_1$	ΔSEL$_2$
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh									
D7	79.1	0.8	0.1	80.0	0.3	-0.2	79.8	0.3	0.1
D8	80.7	0.7	-0.1	81.8	0.2	-0.3	80.8	0.3	0.0
AVG	79.9	0.8	0.0	80.9	0.3	-0.2	80.3	0.3	0.1
STD DV	1.1	0.0	0.1	1.3	0.1	0.1	0.7	0.0	0.1
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh									
D9	78.9	0.2	-0.5	79.0	0.3	-0.0	77.7	0.4	0.1
D10	80.2	0.3	-0.1	79.6	0.4	-0.0	80.1	0.1	0.0
AVG	79.6	0.2	-0.3	79.3	0.3	-0.0	78.9	0.2	0.0
STD DV	0.9	0.1	0.3	0.5	0.0	0.0	1.7	0.2	0.1
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh									
D11	78.9	0.6	-0.1	78.6	0.2	-0.0	78.3	0.2	0.0
D12	81.3	0.4	-0.1	80.9	0.2	-0.6	80.4	0.1	-0.1
AVG	80.1	0.5	-0.1	79.8	0.2	-0.3	79.3	0.2	-0.0
STD DV	1.7	0.1	0.1	1.6	0.0	0.4	1.5	0.1	0.1
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh									
D13	79.5	0.5	-0.2	78.5	0.4	-0.0	78.0	0.5	0.0
D14	81.3	0.4	-0.1	81.2	0.1	-0.7	80.4	0.2	-0.0
AVG	80.4	0.4	-0.2	79.9	0.2	-0.4	79.2	0.3	-0.0
STD DV	1.3	0.1	0.0	1.9	0.2	0.5	1.7	0.2	0.0

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - ΔSEL$_1$ = SEL$_1$-SEL (SEL$_1$ ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - ΔSEL$_2$ = SEL$_2$-SEL (SEL$_2$ CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

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Acoustics Facility

February 11, 1993

TABLE D-F-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER
WITH MUFFLER AND RESONATOR
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/25/91

EV	SITE 1 - CENTERLINE CENTER SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SITE 2 - SIDELINE 150 m WEST SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SITE 3 - SIDELINE 150 m EAST SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
APPROACH -- TARGET IAS 40.8 kts									
B16	90.0	0.3	-0.1	83.9	0.0	-0.2	84.7	-0.5	-0.7
B17	90.6	0.5	0.2	85.9	0.2	-0.4	83.9	0.3	-0.0
B18	90.5	0.7	0.2	84.6	0.2	-0.3	83.6	0.2	-0.0
B20	90.9	0.7	0.2	85.6	0.2	-0.2	83.6	0.3	-0.1
B21	88.0	0.4	0.1	84.4	0.2	-0.2	82.9	-0.0	-0.1
B22	90.1	0.5	0.2	84.1	0.3	-0.2	82.6	0.2	-0.4
B23	88.4	0.4	0.0	82.9	0.1	-0.6	83.9	0.2	-0.1
AVG	89.8	0.5	0.1	84.6	0.2	-0.3	83.4	0.2	-0.1
STD DV	1.2	0.1	0.1	1.1	0.1	0.2	0.5	0.1	0.1
TAKEOFF -- TARGET IAS 40.8 kts									
C24	83.5	0.5	0.3	81.0	0.3	-0.4	82.1	0.3	-0.0
C25	81.6	0.6	0.2	80.5	0.6	0.1	81.5	0.5	0.0
C26	82.8	0.6	0.2	81.1	0.4	-0.1	82.4	0.2	-0.1
C28	83.3	0.6	0.3	81.7	0.4	-0.1	82.8	NO DATA	
C29	82.3	0.6	0.3	81.2	0.2	-0.2	82.6	0.4	0.2
C30	82.3	0.7	0.2	81.0	0.4	0.0	82.5	0.4	0.2
C31	82.5	0.5	0.2	80.5	0.4	-0.2	81.6	0.6	0.3
AVG	82.6	0.6	0.2	81.0	0.4	-0.1	82.2	0.4	0.1
STD DV	0.7	0.1	0.0	0.4	0.1	0.2	0.5	0.2	0.2
150 m FLYOVER -- TARGET IAS 69.3 kts -- 0.9Vh									
A1	78.0	0.7	0.3	79.0	0.3	-0.0	79.1	0.0	-0.2
A2	79.2	0.7	0.1	79.7	0.4	-0.1	80.1	0.2	-0.0
A3	77.7	0.8	0.2	78.5	0.4	-0.1	78.4	0.2	-0.1
A4	78.7	0.9	0.3	79.4	0.5	-0.1	79.9	0.2	-0.1
A6	78.6	0.8	0.2	79.6	0.5	-0.1	80.1	0.1	-0.1
A7	77.4	0.8	0.3	78.2	0.4	-0.2	78.8	0.2	-0.1
AVG	78.3	0.8	0.2	79.0	0.4	-0.1	79.4	0.1	-0.1
STD DV	0.7	0.1	0.1	0.6	0.1	0.1	0.7	0.1	0.0

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

TABLE D-F-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND RESONATOR STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/25/91

	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
EV	SEL*	ΔSEL_1**	ΔSEL_2***	SEL	ΔSEL_1	ΔSEL_2	SEL	ΔSEL_1	ΔSEL_2
--	----	----	----	----	----	----	----	----	----
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
150 m FLYOVER -- TARGET IAS 77.0 kts -- 1.0Vh									
D8	79.1	0.6	-0.0	80.0	0.3	-0.3	80.7	0.3	-0.1
D9	78.3	0.6	-0.0	79.4	0.2	-0.3	79.7	0.2	-0.0
AVG	78.7	0.6	-0.0	79.7	0.3	-0.3	80.2	0.3	-0.0
STD DV	0.6	0.0	0.0	0.5	0.0	0.0	0.7	0.1	0.1
150 m FLYOVER -- TARGET IAS 61.6 kts -- 0.8Vh									
D10	79.0	0.3	-0.1	79.3	0.1	-0.4	79.4	0.2	-0.1
D11	77.5	0.6	-0.0	77.5	0.3	-0.4	77.8	0.4	-0.0
AVG	78.2	0.5	-0.0	78.4	0.2	-0.4	78.6	0.3	-0.1
STD DV	1.0	0.2	0.0	1.3	0.1	0.0	1.1	0.1	0.0
150 m FLYOVER -- TARGET IAS 53.9 kts -- 0.7Vh									
D12	79.3	0.6	-0.1	79.5	-0.0	-0.5	79.8	0.2	-0.3
D13	78.2	0.4	-0.1	77.7	0.2	-0.4	78.5	0.2	0.0
AVG	78.7	0.5	-0.1	78.6	0.1	-0.5	79.1	0.2	-0.1
STD DV	0.8	0.1	0.0	1.3	0.2	0.1	0.9	0.0	0.2
150 m FLYOVER -- TARGET IAS 46.2 kts -- 0.6Vh									
D14	80.0	0.6	0.0	79.3	0.0	-0.8	79.9	0.5	-0.1
D15	78.5	0.5	-0.1	78.0	0.3	-0.3	77.8	0.3	0.1
AVG	79.3	0.5	-0.1	78.6	0.2	-0.5	78.8	0.4	-0.0
STD DV	1.0	0.1	0.1	0.9	0.2	0.4	1.4	0.1	0.2

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

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TABLE D-G-1

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/25/91

EV	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
	SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
APPROACH -- TARGET IAS 40.8 kts									
B16	89.0	0.7	0.3	82.6	0.3	-0.5	82.4	0.6	0.2
B17	89.8	0.7	0.4	84.3	0.4	-0.2	82.4	0.3	0.2
B19	90.1	0.8	0.3	83.0	0.4	-0.5	83.8	0.3	0.1
B20	87.4	0.9	0.3	83.7	0.4	-0.2	81.9	0.4	-0.2
B21	89.1	0.4	0.2	83.2	0.2	-0.2	83.6	0.3	0.1
B24	90.4	0.6	0.3	84.8	0.1	-0.2	83.2	0.3	-0.1
AVG	89.3	0.7	0.3	83.6	0.3	-0.3	82.9	0.4	0.1
STD DV	1.1	0.2	0.0	0.8	0.1	0.2	0.8	0.1	0.2
TAKEOFF -- TARGET IAS 40.8 kts									
C25	83.9	0.7	0.3	81.4	0.3	-0.0	82.3	0.4	0.2
C26	82.2	0.5	0.3	80.8	0.3	-0.1	81.7	0.5	0.2
C27	83.9	0.4	0.2	81.4	0.2	-0.4	82.3	0.2	0.0
C28	83.5	0.5	0.1	80.5	0.4	-0.1	81.8	0.5	0.2
C29	83.1	0.5	0.1	79.8	0.2	-0.4	81.8	0.1	-0.2
C30	83.6	0.5	0.2	80.5	0.3	-0.1	82.0	0.4	0.2
AVG	83.4	0.5	0.2	80.7	0.3	-0.2	82.0	0.3	0.1
STD DV	0.6	0.1	0.1	0.6	0.1	0.2	0.3	0.1	0.1
150 m FLYOVER -- TARGET IAS 72.0 kts -- 0.9Vh									
A2	80.3	0.6	-0.1	79.7	0.5	0.0	80.1	0.5	0.1
A3	80.1	0.5	-0.2	79.1	0.7	-0.1	79.8	0.4	-0.1
A4	80.2	0.8	-0.0	79.8	0.6	-0.1	80.1	0.4	0.1
A5	79.9	0.4	0.0	79.2	0.4	-0.1	79.8	-0.1	-0.6
A6	80.3	0.4	-0.2	79.6	0.6	-0.2	80.1	0.6	0.1
A7	80.1	0.2	-0.2	78.9	0.5	-0.0	79.4	0.6	0.2
AVG	80.2	0.5	-0.1	79.4	0.5	-0.1	79.9	0.4	-0.0
STD DV	0.2	0.2	0.1	0.3	0.1	0.1	0.3	0.2	0.3

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA

** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)

*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

TABLE D-G-2

SCHWEIZER 300 (PISTON ENGINE) HELICOPTER WITH MUFFLER AND DIRECTED EXHAUST STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/25/91

EV	SITE 1 - CENTERLINE CENTER SEL* (dB)	SITE 1 ΔSEL_1** (dB)	SITE 1 ΔSEL_2*** (dB)	SITE 2 - SIDELINE 150 m WEST SEL (dB)	SITE 2 ΔSEL_1 (dB)	SITE 2 ΔSEL_2 (dB)	SITE 3 - SIDELINE 150 m EAST SEL (dB)	SITE 3 ΔSEL_1 (dB)	SITE 3 ΔSEL_2 (dB)
150 m FLYOVER -- TARGET IAS 80.0 kts -- 1.0Vh									
D8	80.0	1.0	-0.1	80.5	0.6	-0.1	80.5	0.5	-0.1
D9	79.5	0.6	-0.1	79.4	0.1	-0.4	80.2	0.6	0.2
AVG	79.8	0.8	-0.1	79.9	0.4	-0.2	80.3	0.6	0.1
STD DV	0.3	0.3	0.1	0.8	0.3	0.2	0.2	0.1	0.2
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.8Vh									
D10	79.9	0.5	-0.5	79.2	0.5	-0.3	79.7	0.4	0.0
D11	80.4	0.5	-0.7	79.4	0.3	-0.2	79.3	0.6	0.0
AVG	80.1	0.5	-0.6	79.3	0.4	-0.3	79.5	0.5	0.0
STD DV	0.3	0.0	0.1	0.1	0.1	0.1	0.3	0.1	0.0
150 m FLYOVER -- TARGET IAS 56.0 kts -- 0.7Vh									
D12	81.1	0.7	-0.1	79.8	0.5	-0.2	79.9	0.4	-0.1
D13	79.4	0.6	0.0	78.7	0.2	-0.5	78.9	0.3	0.2
AVG	80.2	0.7	-0.0	79.2	0.4	-0.3	79.4	0.3	0.0
STD DV	1.2	0.1	0.1	0.8	0.1	0.1	0.7	0.1	0.2
150 m FLYOVER -- TARGET IAS 48.0 kts -- 0.6Vh									
D14	80.8	0.7	0.1	79.4	0.3	-0.3	79.9	0.2	-0.1
D15	80.3	0.5	0.1	78.6	0.2	-0.2	78.9	0.3	0.0
AVG	80.5	0.6	0.1	79.0	0.3	-0.2	79.4	0.3	-0.0
STD DV	0.4	0.1	0.0	0.6	0.1	0.1	0.7	0.0	0.0

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

U.S. Department of Transportation
Volpe Center
Acoustics Facility

February 11, 1993

TABLE D-H-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/23/91

EV	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
	SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
APPROACH -- TARGET IAS 50.0 kts									
B17	89.8	0.9	0.4	84.3	0.8	0.2	80.9	0.4	0.1
B18	86.1	0.6	0.3	83.4	0.3	-0.1	80.2	0.3	-0.1
B19	90.2	0.6	0.3	86.9	0.6	0.3	81.7	0.4	0.1
B20	91.0	0.8	0.5	85.4	0.6	0.2	83.8	0.5	0.2
B21	91.4	0.6	0.4	86.1	0.4	0.3	83.3	0.2	0.1
B22	92.0	0.7	0.4	85.7	0.5	0.2	83.3	0.3	0.1
AVG	90.1	0.7	0.4	85.3	0.5	0.2	82.2	0.3	0.1
STD DV	2.1	0.1	0.1	1.3	0.2	0.1	1.5	0.1	0.1
TAKEOFF -- TARGET IAS 50.0 kts									
C29	80.4	0.5	-0.1	79.0	-0.0	-0.1	79.6	0.4	0.3
C30	79.7	0.3	-0.0	78.5	0.1	-0.8	79.3	0.5	0.3
C31	80.1	0.4	0.1	79.2	0.2	-0.1	79.5	0.4	0.3
C32	80.4	0.3	-0.0	79.1	-0.0	-0.1	79.6	0.5	0.3
C33	81.4	-0.3	-0.6	78.7	0.0	-0.1	79.2	-0.2	-0.4
C34	81.3	0.4	0.1	79.6	0.2	-0.0	79.6	NO DATA	
AVG	80.6	0.3	-0.1	79.0	0.1	-0.2	79.5	0.3	0.2
STD DV	0.7	0.3	0.3	0.4	0.1	0.3	0.2	0.3	0.3
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh									
A1	82.2	-0.1	-0.3	80.2	0.5	0.1	80.1	-0.1	-0.5
A2	83.1	-0.1	-0.3	82.5	0.2	-0.1	81.1	0.6	0.2
A3	81.3	0.2	-0.2	79.7	0.4	0.1	80.5	0.5	0.3
A5	82.7	-0.0	-0.3	82.4	0.3	0.1	81.0	0.6	0.3
A6	81.2	0.1	-0.3	80.2	0.3	0.0	80.2	0.1	-0.1
A7	82.1	0.2	-0.2	81.9	0.2	-0.0	80.4	0.6	0.2
AVG	82.1	0.0	-0.3	81.2	0.3	0.0	80.6	0.4	0.1
STD DV	0.7	0.1	0.0	1.3	0.1	0.1	0.4	0.3	0.3

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

TABLE D-H-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER STANDARD 2-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/23/91

EV	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
	SEL*	ΔSEL_1**	ΔSEL_2***	SEL	ΔSEL_1	ΔSEL_2	SEL	ΔSEL_1	ΔSEL_2
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh									
D8	80.3	0.5	0.2	81.3	0.3	0.0	81.7	0.4	0.2
D9	82.1	0.6	0.2	83.2	0.2	0.0	82.6	0.6	0.2
AVG	81.2	0.6	0.2	82.2	0.3	0.0	82.1	0.5	0.2
STD DV	1.3	0.1	0.0	1.3	0.1	0.0	0.6	0.2	0.0
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh									
D10	78.3	0.4	0.3	78.4	0.2	-0.1	79.1	0.2	0.1
D11	81.0	0.5	0.2	82.0	0.2	-0.0	80.4	0.3	0.0
AVG	79.7	0.4	0.2	80.2	0.2	-0.1	79.7	0.3	0.1
STD DV	1.9	0.1	0.0	2.6	0.0	0.0	0.9	0.1	0.1
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh									
D12	78.7	0.6	0.2	78.1	0.2	-0.1	78.8	0.5	0.1
D13	80.7	0.5	0.2	80.9	0.2	-0.0	80.0	0.2	-0.1
AVG	79.7	0.6	0.2	79.5	0.2	-0.0	79.4	0.3	-0.0
STD DV	1.4	0.1	0.0	2.0	0.0	0.0	0.8	0.2	0.1
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh									
D14	80.7	0.5	0.2	78.4	0.1	-0.1	78.3	0.5	0.3
D15	81.0	0.5	0.1	80.3	0.2	-0.5	79.5	0.4	0.1
AVG	80.8	0.5	0.2	79.4	0.1	-0.3	78.9	0.4	0.2
STD DV	0.2	0.0	0.1	1.3	0.1	0.3	0.8	0.1	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

U.S. Department of Transportation

Volpe Center Acoustics Facility

February 11, 1993

TABLE D-I-1

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/24/91

	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
EV	SEL*	ΔSEL_1**	ΔSEL_2***	SEL	ΔSEL_1	ΔSEL_2	SEL	ΔSEL_1	ΔSEL_2
--	----	----	----	----	----	----	----	----	----
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
APPROACH -- TARGET IAS 50.0 kts									
B16	92.3	0.4	0.0	87.0	0.6	0.3	83.0	0.1	-0.3
B17	89.2	0.7	0.1	83.6	0.5	0.3	82.7	0.1	-0.2
B18	90.3	0.7	0.0	86.8	0.7	0.4	80.6	0.1	-0.7
B19	91.8	0.5	0.1	86.6	0.6	0.3	83.2	-0.2	-0.6
B20	91.5	0.3	-0.1	84.3	0.8	0.3	83.9	0.3	-0.5
B21	91.7	0.3	0.0	87.3	0.7	0.3	83.2	-0.1	-0.2
AVG	91.1	0.5	0.0	85.9	0.7	0.3	82.8	0.0	-0.4
STD DV	1.2	0.2	0.1	1.6	0.1	0.0	1.1	0.2	0.2
TAKEOFF -- TARGET IAS 50.0 kts									
C22	77.9	0.4	-0.0	76.7	0.2	-0.1	76.9	0.3	0.1
C23	77.2	0.4	-0.0	76.5	0.3	-0.1	76.3	0.3	-0.1
C24	77.8	0.4	0.0	76.6	0.5	-0.0	76.0	0.4	0.2
C25	77.8	0.2	-0.2	76.7	0.4	0.1	76.0	0.7	0.5
C26	78.0	0.6	0.1	77.2	0.3	0.0	76.9	0.5	0.2
C27	77.3	0.2	-0.2	76.7	0.3	0.0	76.3	0.8	0.5
AVG	77.7	0.4	-0.1	76.7	0.3	-0.0	76.4	0.5	0.2
STD DV	0.3	0.1	0.1	0.2	0.1	0.1	0.4	0.2	0.2
150 m FLYOVER -- TARGET IAS 93.6 kts -- 0.9Vh									
A1	77.0	0.7	0.4	75.9	0.3	0.1	76.3	0.0	-0.1
A2	77.5	0.7	0.3	77.1	0.4	0.0	76.6	0.1	-0.1
A3	76.7	0.6	0.3	76.0	0.4	0.1	76.6	0.2	-0.1
A4	77.5	0.6	0.4	76.7	0.5	0.1	76.7	NO DATA	
A5	76.5	0.6	0.3	75.5	0.4	0.1	75.7	0.2	-0.3
A6	77.4	0.6	0.4	76.7	0.3	0.0	76.2	0.3	-0.2
AVG	77.1	0.6	0.3	76.3	0.4	0.1	76.3	0.2	-0.2
STD DV	0.4	0.0	0.1	0.6	0.1	0.0	0.4	0.1	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA

** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)

*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

U.S. Department
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Volpe Center
Acoustics Facility

February 11, 1993

TABLE D-I-2

SCHWEIZER 330 (TURBINE ENGINE) HELICOPTER
4-BLADE 51" DIA. TAIL ROTOR

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/24/91

EV	SITE 1 - CENTERLINE CENTER SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SITE 2 - SIDELINE 150 m WEST SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SITE 3 - SIDELINE 150 m EAST SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
150 m FLYOVER -- TARGET IAS 104.0 kts -- 1.0Vh									
D7	78.0	0.1	-0.2	77.9	0.4	0.2	77.1	0.2	-0.0
D8	78.0	0.3	-0.1	77.8	0.4	0.1	78.0	0.1	-0.1
AVG	78.0	0.2	-0.1	77.8	0.4	0.1	77.5	0.2	-0.0
STD DV	0.0	0.1	0.0	0.0	0.0	0.0	0.6	0.0	0.0
150 m FLYOVER -- TARGET IAS 83.2 kts -- 0.8Vh									
D9	76.7	0.1	-0.1	75.1	0.3	0.2	75.5	-0.1	-0.3
D10	77.4	0.1	-0.1	76.1	0.4	0.1	76.1	-0.2	-0.2
AVG	77.0	0.1	-0.1	75.6	0.4	0.1	75.8	-0.1	-0.3
STD DV	0.5	0.0	0.0	0.7	0.0	0.0	0.4	0.0	0.0
150 m FLYOVER -- TARGET IAS 72.8 kts -- 0.7Vh									
D11	76.5	0.2	-0.1	75.3	0.2	0.1	75.2	NO DATA	
D12	77.8	0.1	-0.1	76.0	0.3	0.1	76.1	0.1	-0.1
AVG	77.2	0.1	-0.1	75.6	0.3	0.1	75.6	0.1	-0.1
STD DV	0.9	0.0	0.0	0.5	0.1	0.0	0.7	0.0	0.0
150 m FLYOVER -- TARGET IAS 62.4 kts -- 0.6Vh									
D13	76.7	0.2	-0.1	74.9	0.3	0.1	75.2	0.3	0.1
D14	78.8	0.1	-0.1	76.4	0.5	0.1	76.4	0.2	-0.1
AVG	77.8	0.2	-0.1	75.7	0.4	0.1	75.8	0.2	-0.0
STD DV	1.5	0.1	0.0	1.0	0.2	0.0	0.8	0.0	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

U.S. Department of Transportation

Volpe Center Acoustics Facility

February 11, 1993

TABLE D-J-1

ENSTROM 280FX HELICOPTER (PISTON ENGINE)

SEL COMPARISON ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS — 07/26/91

EV	SITE 1 - CENTERLINE CENTER SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SITE 2 - SIDELINE 150 m WEST SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SITE 3 - SIDELINE 150 m EAST SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
APPROACH -- TARGET IAS 50.4 kts									
BP9	85.1	0.4	0.1	83.5	0.1	-0.2	79.7	0.0	-0.3
BP10	87.3	0.4	0.1	83.2	0.0	-0.3	80.6	0.0	-0.3
BP11	84.5	0.4	0.0	83.2	0.1	-0.2	79.6	-0.1	-0.4
BP12	86.6	0.6	0.2	83.5	-0.0	-0.3	80.0	0.1	-0.2
BP13	87.2	0.5	0.1	82.8	-0.1	-0.4	80.1	0.2	-0.2
BP14	86.7	0.5	0.1	83.1	0.1	-0.2	80.3	0.1	-0.3
AVG	86.2	0.5	0.1	83.2	0.0	-0.3	80.0	0.1	-0.3
STD DV	1.2	0.1	0.1	0.3	0.1	0.1	0.4	0.1	0.1
TAKEOFF -- TARGET IAS 50.4 kts									
CP22	83.7	0.4	-0.0	81.9	0.3	-0.1	84.1	0.1	-0.2
CP23	83.7	0.8	0.4	82.0	0.6	0.0	84.3	0.3	-0.0
CP24	84.0	0.9	0.5	82.0	0.4	-0.2	84.5	0.1	-0.3
CP25	83.6	0.7	0.3	81.9	0.4	0.0	84.1	0.3	0.0
CP26	83.5	0.8	0.4	81.5	0.3	-0.0	84.3	0.3	-0.2
CP27	83.8	0.9	0.3	81.1	0.4	0.0	84.1	0.1	-0.4
AVG	83.7	0.8	0.3	81.7	0.4	-0.0	84.2	0.2	-0.2
STD DV	0.2	0.2	0.2	0.4	0.1	0.1	0.2	0.1	0.1
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9 Vh									
AP42	80.3	0.2	-0.1	79.0	0.6	0.1	81.1	0.4	0.1
AP43	81.0	0.4	-0.1	81.9	0.5	0.1	79.9	0.3	0.1
AP44	79.8	0.6	0.2	78.4	0.6	-0.0	80.9	0.3	0.0
AP45	81.3	0.4	0.2	82.4	0.4	0.1	79.8	0.3	0.1
AP46	80.0	0.3	-0.1	79.0	0.6	-0.0	81.0	0.2	0.1
AP47	80.6	0.4	0.1	81.3	0.6	0.1	79.8	0.3	-0.2
AVG	80.5	0.4	0.0	80.3	0.5	0.1	80.4	0.3	0.1
STD DV	0.6	0.1	0.1	1.7	0.1	0.1	0.7	0.1	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA

** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)

*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 11, 1993

TABLE D-J-2

ENSTROM 280FX HELICOPTER
(PISTON ENGINE)

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/26/91

EV	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
	SEL*	ΔSEL_1**	ΔSEL_2***	SEL	ΔSEL_1	ΔSEL_2	SEL	ΔSEL_1	ΔSEL_2
--	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh									
DP48	80.6	0.7	0.2	79.6	0.5	0.1	82.6	0.5	0.2
DP49	81.5	0.5	0.2	82.8	0.6	0.2	80.5	0.2	0.0
AVG	81.0	0.6	0.2	81.2	0.6	0.2	81.5	0.4	0.1
STD DV	0.7	0.1	0.0	2.3	0.1	0.1	1.5	0.2	0.1
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh									
DP51	79.7	0.7	-0.0	78.5	0.3	-0.1	80.8	0.3	0.1
DP52	80.8	0.5	0.2	81.5	0.6	0.1	79.4	0.2	0.0
AVG	80.3	0.6	0.1	80.0	0.4	-0.0	80.1	0.3	0.1
STD DV	0.8	0.1	0.1	2.2	0.2	0.1	1.0	0.0	0.0
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh									
DP53	79.1	0.4	0.1	77.5	0.4	-0.0	75.6	1.1	0.7
DP54	80.7	0.5	-0.0	81.5	0.3	-0.1	78.7	0.4	-0.0
AVG	79.9	0.4	0.0	79.5	0.4	-0.0	77.1	0.8	0.4
STD DV	1.1	0.1	0.1	2.8	0.0	0.0	2.2	0.5	0.5
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh									
DP55	79.1	0.5	0.1	77.3	0.5	-0.1	79.3	0.1	0.0
DP57	80.8	0.5	0.2	80.7	0.4	-0.1	78.6	0.1	-0.1
AVG	80.0	0.5	0.2	79.0	0.5	-0.1	79.0	0.1	-0.1
STD DV	1.2	0.0	0.1	2.4	0.1	0.0	0.5	0.0	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 11, 1993

TABLE D-K-1

ENSTROM TH28 HELICOPTER
(TURBINE ENGINE)

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS

07/26/91

EV	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
--	SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
APPROACH -- TARGET IAS 55.0 kts									
BT1	89.1	0.6	0.2	85.7	0.3	-0.0	81.8	-0.2	-0.3
BT2	89.3	0.6	0.2	86.2	0.2	-0.1	80.9	0.1	-0.1
BT4	89.6	0.4	0.1	85.4	0.1	-0.1	81.7	0.1	-0.2
BT5	89.0	0.3	0.1	85.3	0.3	-0.1	81.1	0.0	-0.4
BT6	89.7	0.3	0.1	84.8	0.2	-0.3	80.9	-0.1	-0.3
BT7	88.8	0.4	0.1	85.3	0.4	-0.1	81.4	-0.1	-0.2
AVG	89.3	0.4	0.1	85.4	0.2	-0.1	81.3	-0.0	-0.3
STD DV	0.3	0.1	0.0	0.5	0.1	0.1	0.4	0.1	0.1
TAKEOFF -- TARGET IAS 54.0 kts									
CT16	86.8	0.4	0.2	84.2	0.6	0.3	83.1	0.5	-0.2
CT17	86.4	0.5	0.0	84.2	0.6	0.2	83.7	0.3	0.1
CT18	86.3	0.5	0.0	84.3	0.7	0.3	83.2	0.4	0.1
CT19	86.1	0.5	0.0	84.0	0.6	0.3	83.9	0.4	0.1
CT20	86.4	0.5	0.1	83.5	0.4	0.0	82.8	0.2	-0.3
CT21	86.2	0.6	0.1	83.7	0.6	0.3	82.3	0.3	0.0
AVG	86.3	0.5	0.1	84.0	0.6	0.2	83.2	0.3	-0.0
STD DV	0.2	0.1	0.0	0.3	0.1	0.1	0.6	0.1	0.2
150 m FLYOVER -- TARGET IAS 90.0 kts -- 0.9Vh									
AT28	81.9	0.4	0.2	81.9	0.2	-0.1	81.4	-0.0	-0.3
AT29	82.8	0.5	0.2	82.7	0.3	-0.3	82.1	0.5	0.1
AT30	82.1	0.5	0.2	81.7	0.2	-0.2	81.5	0.4	0.2
AT31	82.2	0.5	0.2	81.5	0.1	-0.2	81.5	0.4	0.2
AT32	81.6	0.5	0.1	81.6	0.3	-0.1	80.6	NO DATA	
AT33	81.8	0.3	0.1	81.7	0.2	-0.1	81.6	0.6	0.3
AVG	82.1	0.4	0.2	81.9	0.2	-0.2	81.5	0.4	0.1
STD DV	0.4	0.1	0.0	0.4	0.1	0.1	0.5	0.2	0.2

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 11, 1993

TABLE D-K-2

ENSTROM TH28 HELICOPTER
(TURBINE ENGINE)

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/26/91

	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
EV	SEL*	ΔSEL_1**	ΔSEL_2***	SEL	ΔSEL_1	ΔSEL_2	SEL	ΔSEL_1	ΔSEL_2
--	----	----	----	----	----	----	----	----	----
	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
150 m FLYOVER -- TARGET IAS 100.0 kts -- 1.0Vh									
DT34	83.0	0.8	0.4	83.1	0.6	0.2	82.8	0.4	0.2
DT35	84.1	0.8	0.4	83.8	0.5	0.3	83.8	0.3	0.1
AVG	83.6	0.8	0.4	83.4	0.6	0.3	83.3	0.3	0.1
STD DV	0.7	0.0	0.0	0.5	0.1	0.1	0.7	0.0	0.0
150 m FLYOVER -- TARGET IAS 80.0 kts -- 0.8Vh									
DT36	81.2	0.6	0.3	80.4	0.6	0.2	80.5	0.5	0.2
DT37	82.3	0.6	0.3	81.0	0.7	-0.0	81.4	0.4	0.2
AVG	81.8	0.6	0.3	80.7	0.6	0.1	80.9	0.4	0.2
STD DV	0.8	0.0	0.0	0.4	0.1	0.1	0.6	0.1	0.0
150 m FLYOVER -- TARGET IAS 70.0 kts -- 0.7Vh									
DT38	80.8	0.6	0.1	79.7	0.4	0.1	79.5	0.3	0.1
DT39	82.0	0.5	0.3	80.9	0.4	-0.2	80.9	0.3	0.1
AVG	81.4	0.6	0.2	80.3	0.4	-0.1	80.2	0.3	0.1
STD DV	0.9	0.1	0.1	0.8	0.0	0.2	1.0	0.0	0.0
150 m FLYOVER -- TARGET IAS 60.0 kts -- 0.6Vh									
DT40	81.4	0.7	0.3	79.3	0.5	0.0	79.2	0.2	0.1
DT41	82.5	0.7	0.2	80.9	0.5	-0.1	81.1	0.4	0.2
AVG	81.9	0.7	0.3	80.1	0.5	-0.0	80.1	0.3	0.1
STD DV	0.8	0.0	0.0	1.1	0.0	0.0	1.4	0.1	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

TABLE D-L-1

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/22/91

	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
EV	SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
APPROACH -- TARGET IAS 52.0 kts									
B15	88.8	0.5	0.2	85.3	0.5	-0.0	86.6	0.5	-0.1
B16	89.1	0.5	0.2	85.7	0.3	0.0	87.2	0.3	-0.5
B17	93.9	0.6	0.3	85.4	0.8	0.0	87.7	0.5	0.2
B18	94.1	0.6	0.3	84.6	0.9	-0.0	88.8	0.4	0.0
B19	89.6	0.6	0.2	87.3	0.6	-0.7	86.9	0.6	0.2
B20	92.5	0.8	0.1	83.1	0.5	0.4	87.3	0.5	0.0
B21	93.5	0.7	0.2	84.7	0.3	-0.5	86.8	0.4	0.2
AVG	92.1	0.6	0.2	85.1	0.6	-0.1	87.4	0.5	0.0
STD DV	2.2	0.1	0.1	1.4	0.2	0.4	0.7	0.1	0.3
TAKEOFF -- TARGET IAS 52.0 kts									
C22	84.8	0.5	0.2	80.5	0.4	0.1	80.5	0.3	0.1
C23	84.0	0.7	0.2	79.5	0.5	0.1	80.4	0.6	0.5
C24	84.7	0.4	0.1	81.4	0.6	0.2	80.9	0.4	0.1
C25	84.3	0.5	0.2	80.0	0.4	0.1	80.6	0.3	0.2
C26	84.1	0.7	0.1	81.1	0.5	0.1	80.7	0.4	0.2
C27	84.1	0.6	0.2	79.8	0.7	0.3	80.0	0.3	0.1
AVG	84.3	0.6	0.2	80.4	0.5	0.1	80.5	0.4	0.2
STD DV	0.3	0.1	0.1	0.7	0.1	0.1	0.3	0.1	0.1
150 m FLYOVER -- TARGET IAS 82.0 kts -- 0.9Vh									
A1	77.0	0.3	0.0	77.4	0.4	0.1	76.5	0.0	-0.3
A2	77.6	0.4	0.1	76.1	0.4	-0.0	77.2	-0.0	-0.3
A3	77.4	0.2	0.0	76.8	0.4	-0.0	76.7	0.1	-0.1
A4	78.6	0.3	0.0	77.0	0.3	-0.2	77.5	0.1	-0.1
A5	76.7	0.2	-0.3	76.3	0.5	0.0	76.1	0.1	-0.1
A9	77.3	0.2	-0.2	76.1	0.6	-0.1	77.3	0.2	-0.1
AVG	77.4	0.3	-0.1	76.6	0.4	-0.0	76.9	0.1	-0.2
STD DV	0.6	0.1	0.2	0.5	0.1	0.1	0.5	0.1	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

U.S. Department
of Transportation

Volpe Center
Acoustics Facility

February 11, 1993

TABLE D-L-2

ROTORWAY EXEC 90 HELICOPTER
STANDARD MODEL
(PISTON ENGINE - 2-BLADE MAIN ROTOR - 2-BLADE TAIL ROTOR)

SEL COMPARISON
ONE-THIRD OCTAVE DERIVED vs. ON-SITE SLM DATA

CHAMPAIGN, ILLINOIS 07/22/91

	SITE 1 - CENTERLINE CENTER			SITE 2 - SIDELINE 150 m WEST			SITE 3 - SIDELINE 150 m EAST		
EV	SEL* (dB)	ΔSEL_1** (dB)	ΔSEL_2*** (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)	SEL (dB)	ΔSEL_1 (dB)	ΔSEL_2 (dB)
150 m FLYOVER -- TARGET IAS 91.0 kts -- 1.0Vh									
A6	77.5	0.4	-0.4	76.9	0.2	-0.4	77.2	0.4	0.1
A7	**	NO DATA	**	**	NO DATA	**	**	NO DATA	
AVG	77.5	0.4	-0.4	76.9	0.2	-0.4	77.2	0.4	0.1
STD DV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150 m FLYOVER -- TARGET IAS 73.0 kts -- 0.8Vh									
A8	77.5	0.4	-0.0	76.4	0.4	-0.1	76.7	0.5	0.1
A10	77.4	0.2	-0.2	76.7	0.4	-0.0	76.6	0.5	-0.0
AVG	77.5	0.3	-0.1	76.6	0.4	-0.1	76.7	0.5	0.0
STD DV	0.1	0.1	0.1	0.2	0.0	0.1	0.0	0.0	0.1
150 m FLYOVER -- TARGET IAS 64.0 kts -- 0.7Vh									
A11	78.8	0.2	-0.3	77.1	0.3	-0.2	76.8	0.5	-0.0
A12	78.7	0.1	-0.2	76.4	0.5	-0.0	76.3	0.4	-0.0
AVG	78.7	0.2	-0.2	76.7	0.4	-0.1	76.6	0.4	-0.0
STD DV	0.1	0.1	0.1	0.5	0.1	0.1	0.3	0.1	0.0
150 m FLYOVER -- TARGET IAS 55.0 kts -- 0.6Vh									
A13	79.6	0.0	-0.3	77.2	0.6	-0.1	77.2	0.2	-0.1
A14	78.3	0.1	-0.3	76.1	0.6	-0.0	76.6	0.3	-0.0
AVG	78.9	0.1	-0.3	76.6	0.6	-0.0	76.9	0.2	-0.1
STD DV	0.9	0.0	0.1	0.7	0.0	0.0	0.4	0.1	0.1

* - SEL DERIVED FROM 1/3-OCTAVE ANALYSIS OF TAPED NOISE DATA
** - $\Delta SEL_1 = SEL_1 - SEL$ (SEL_1 ON-SITE SLM VALUE BASED UPON OPERATOR ESTIMATE OF 10 TO 15dB-DOWN DURATION)
*** - $\Delta SEL_2 = SEL_2 - SEL$ (SEL_2 CALCULATED FROM STORED SLM HISTORY DATA BASED UPON 10dB-DOWN DURATION)

APPENDIX E

DELTA 3: SOURCE NOISE CORRECTION

This Appendix presents plots and a statistical summary of the least-squares regression model (and associated 90 percent confidence interval) fit through the Mach $Number_{ABT}$ vs. $PNLT_{max}$ reference data set for level flyover source noise correction, Figures E-1 through E-12. Also included are the regression model equations for the four alternate data sets, Tables E-1 through E-3.

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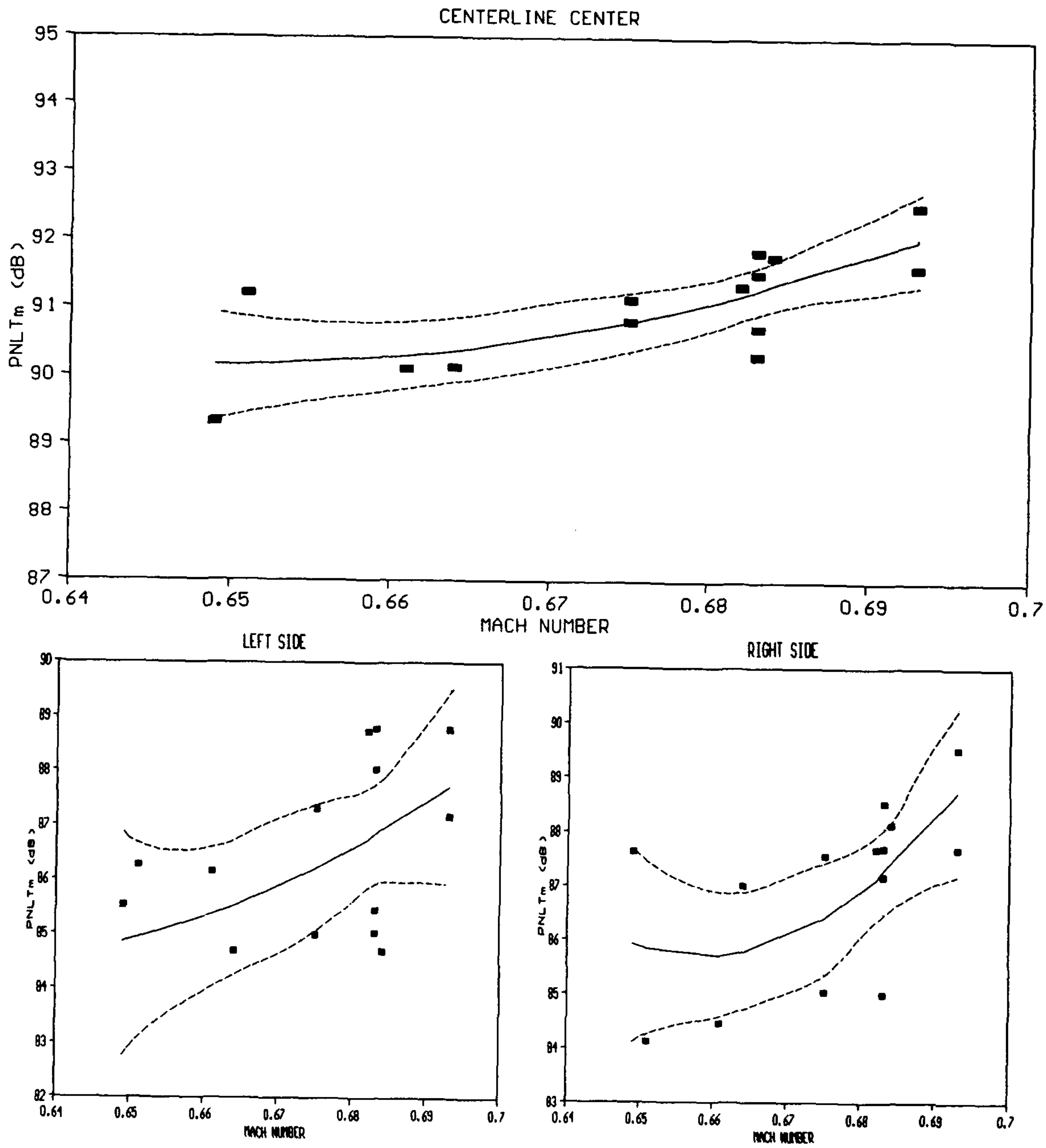
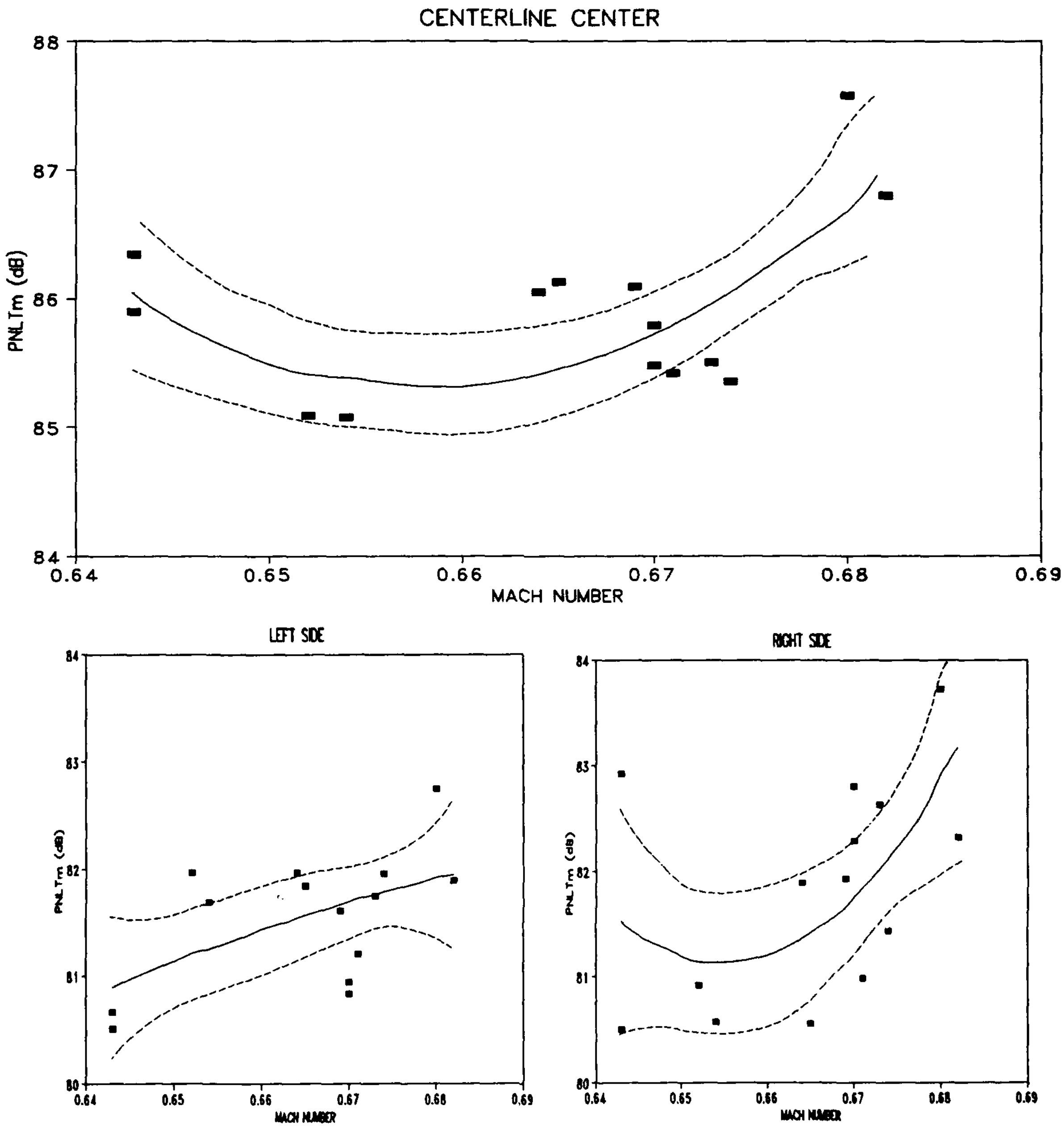


	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$978.3X^2 - 1269.5X + 502.0$	.74	.63
LEFT SIDE	$703.6X^2 - 878.5X + 358.7$	.53	1.61
RIGHT SIDE	$2573.0X^2 - 3386.4X + 1199.9$	.61	1.40

FIGURE E-1. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER
SCHWEIZER 300 - CONFIGURATION A
7/22/91



	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$3027.2X^2 - 3985.5X + 1397.1$	.72	.52
LEFT SIDE	$-198.8X^2 + 290.3X - 23.6$	.55	.57
RIGHT SIDE	$2757.5X^2 - 3611.2X + 1263.4$	.59	.90

FIGURE E-2. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER
SCHWEIZER 300 - CONFIGURATION B
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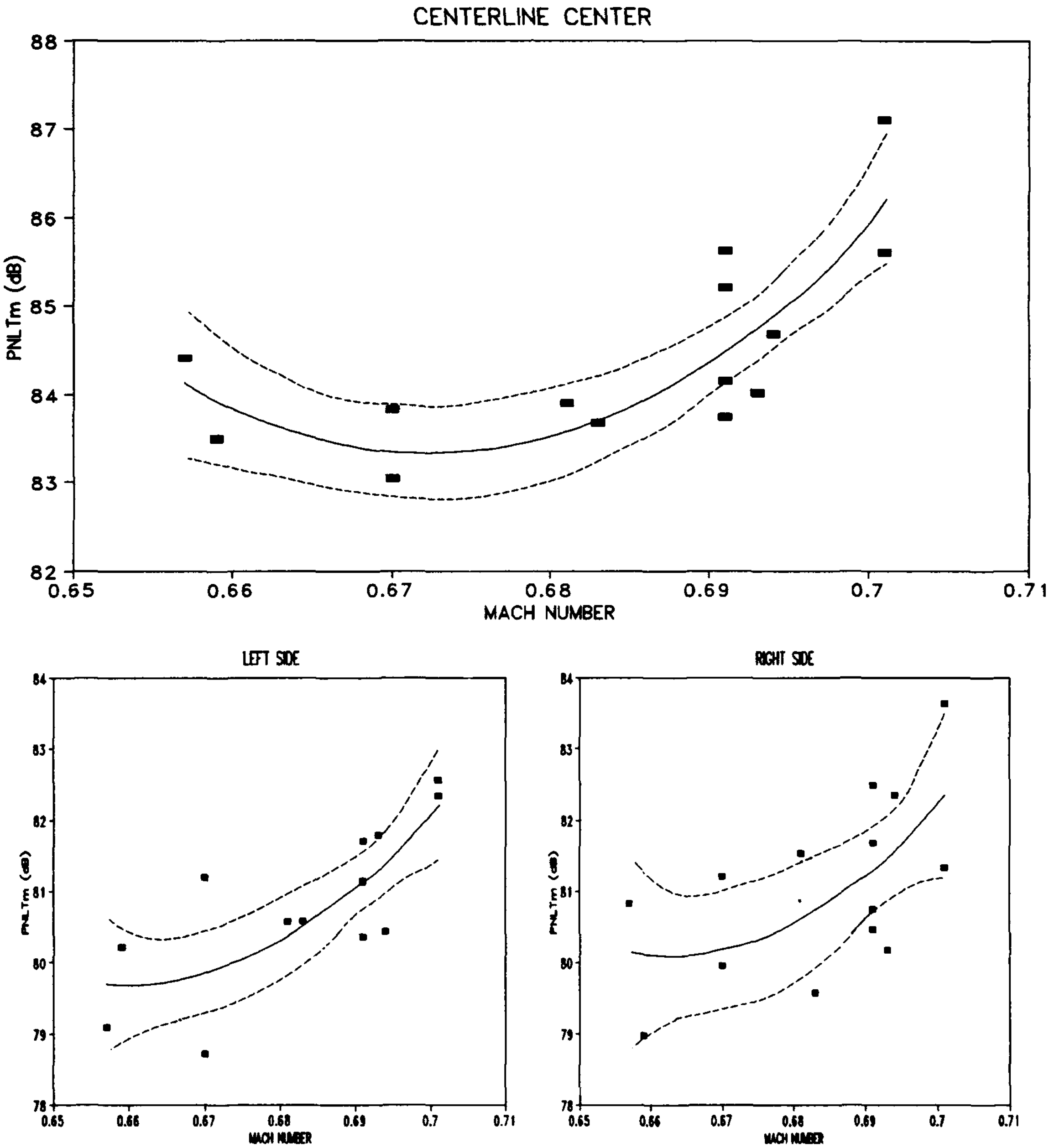
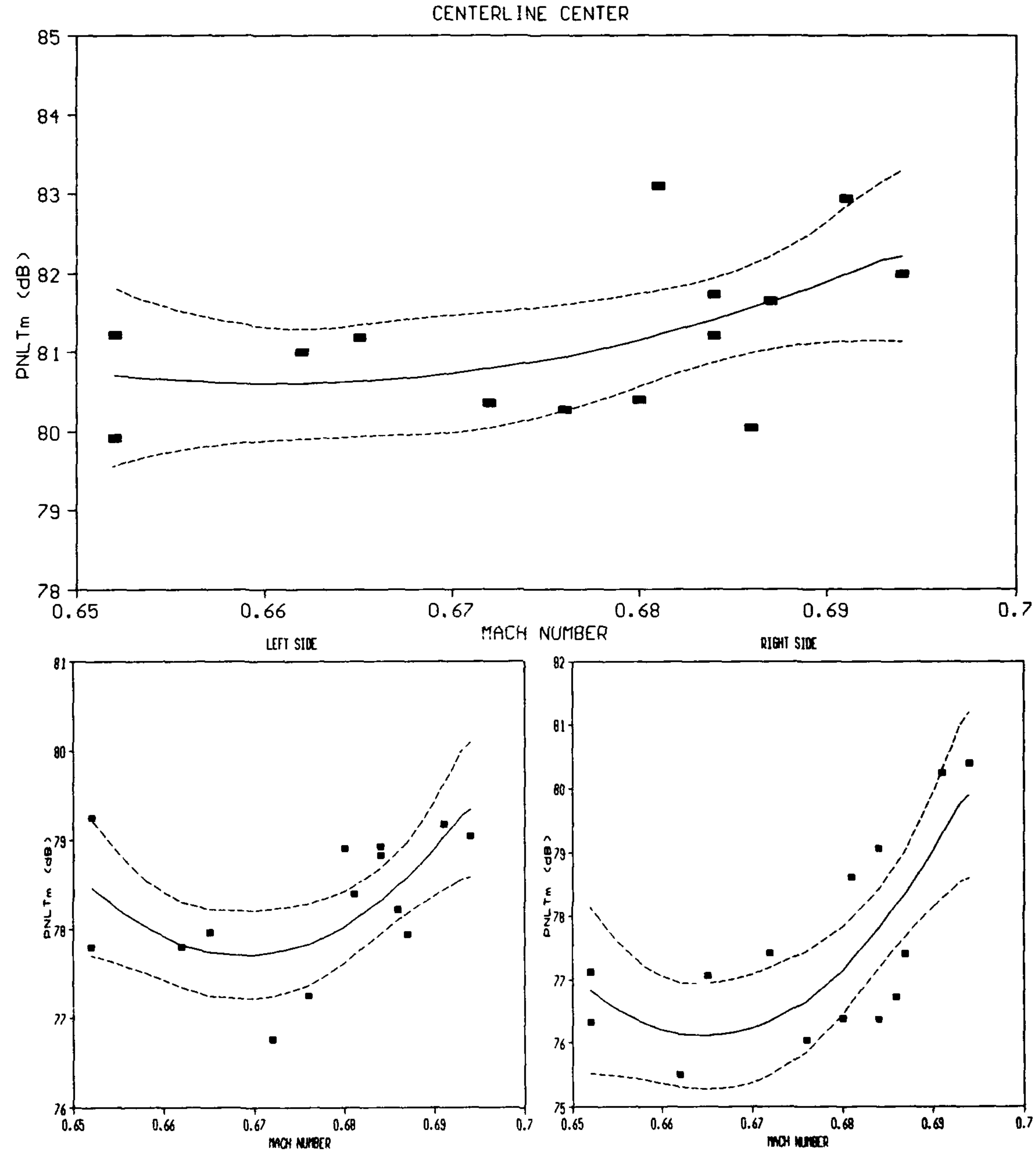


	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$3360.2X^2 - 4516.0X + 1600.7$	.83	.66
LEFT SIDE	$1398.8X^2 - 1842.4X + 686.4$	.79	.74
RIGHT SIDE	$1518.0X^2 - 2011.7X + 746.6$	.61	1.07

FIGURE E-3. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER
SCHWEIZER 300 - CONFIGURATION C
7/23/91



	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$1492.1X^2 -1971.3X +731.7$	.52	.93
LEFT SIDE	$2688.9X^2 -3597.3X + 1280.8$	.63	.64
RIGHT SIDE	$4589.1X^2 -6101.1X + 2103.9$	.75	1.10

FIGURE E-4. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER
SCHWEIZER 300 - CONFIGURATION D
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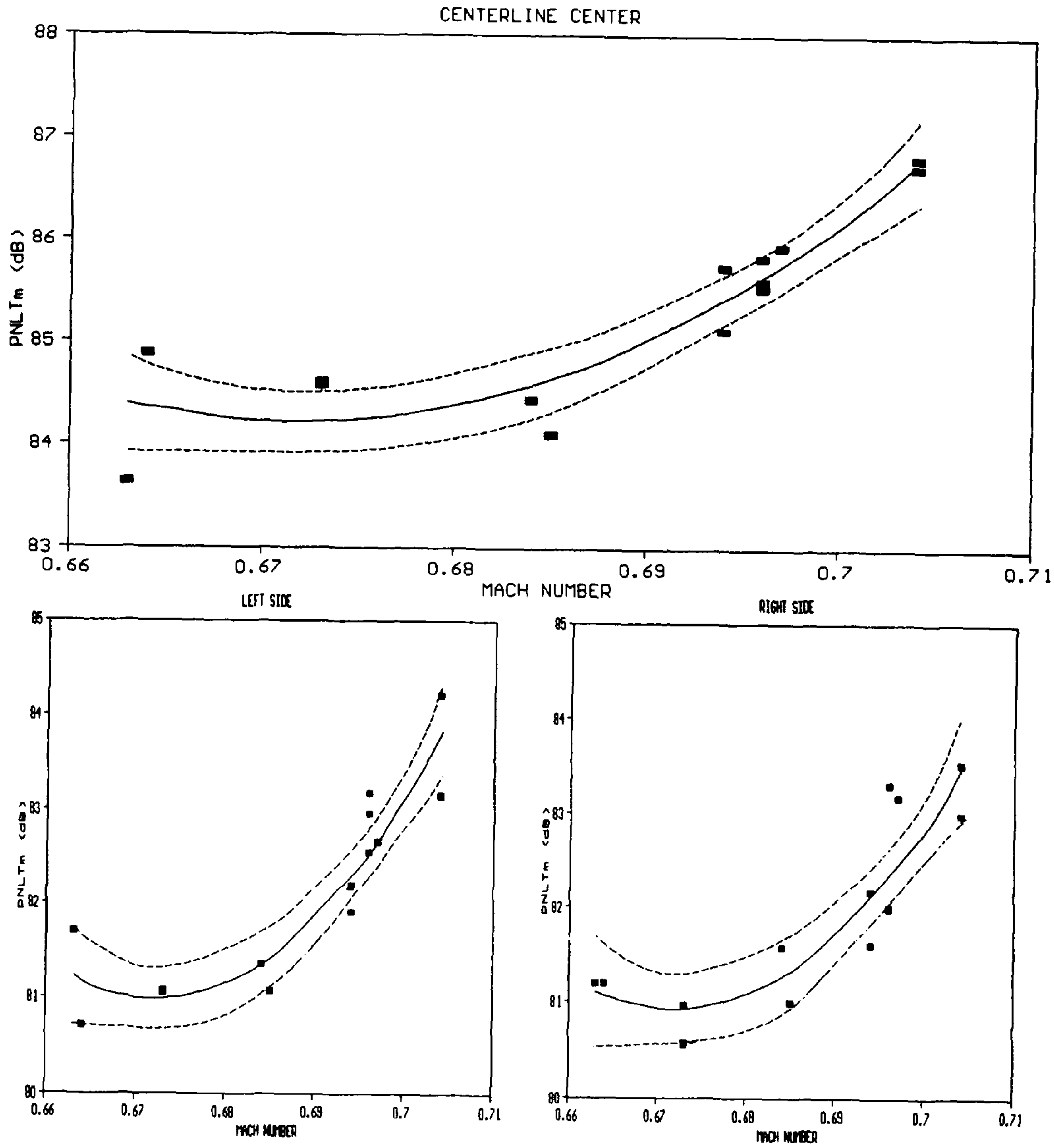

	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$2384.0X^2 -3202.3X +1159.6$	.93	.39
LEFT SIDE	$2762.5X^2 -3714.6X + 1329.7$	.93	.43
RIGHT SIDE	$2403.7X^2 -3229.9X + 1166.0$	.89	.48

FIGURE E-5. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER
SCHWEIZER 300 - CONFIGURATION E
7/24/91

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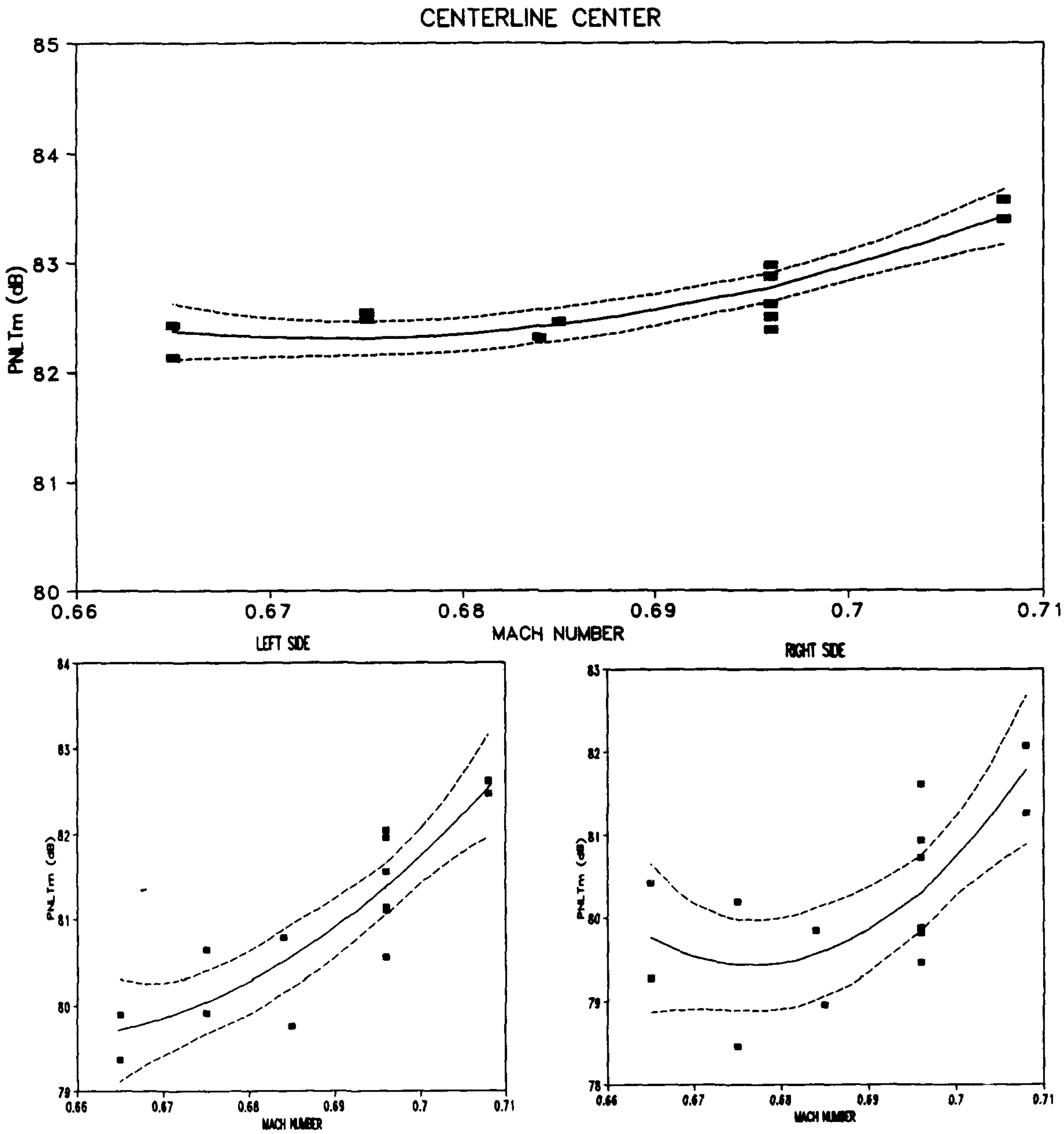

	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$932.4X^2 - 1255.6 + 505.0$	.88	.22
LEFT SIDE	$1048.3X^2 - 1372.8X + 529.1$	.89	.51
RIGHT SIDE	$2425.8X^2 - 3283.4X + 1190.4$	.73	.77

FIGURE E-6. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER
SCHWEIZER 300 - CONFIGURATION F
7/25/91

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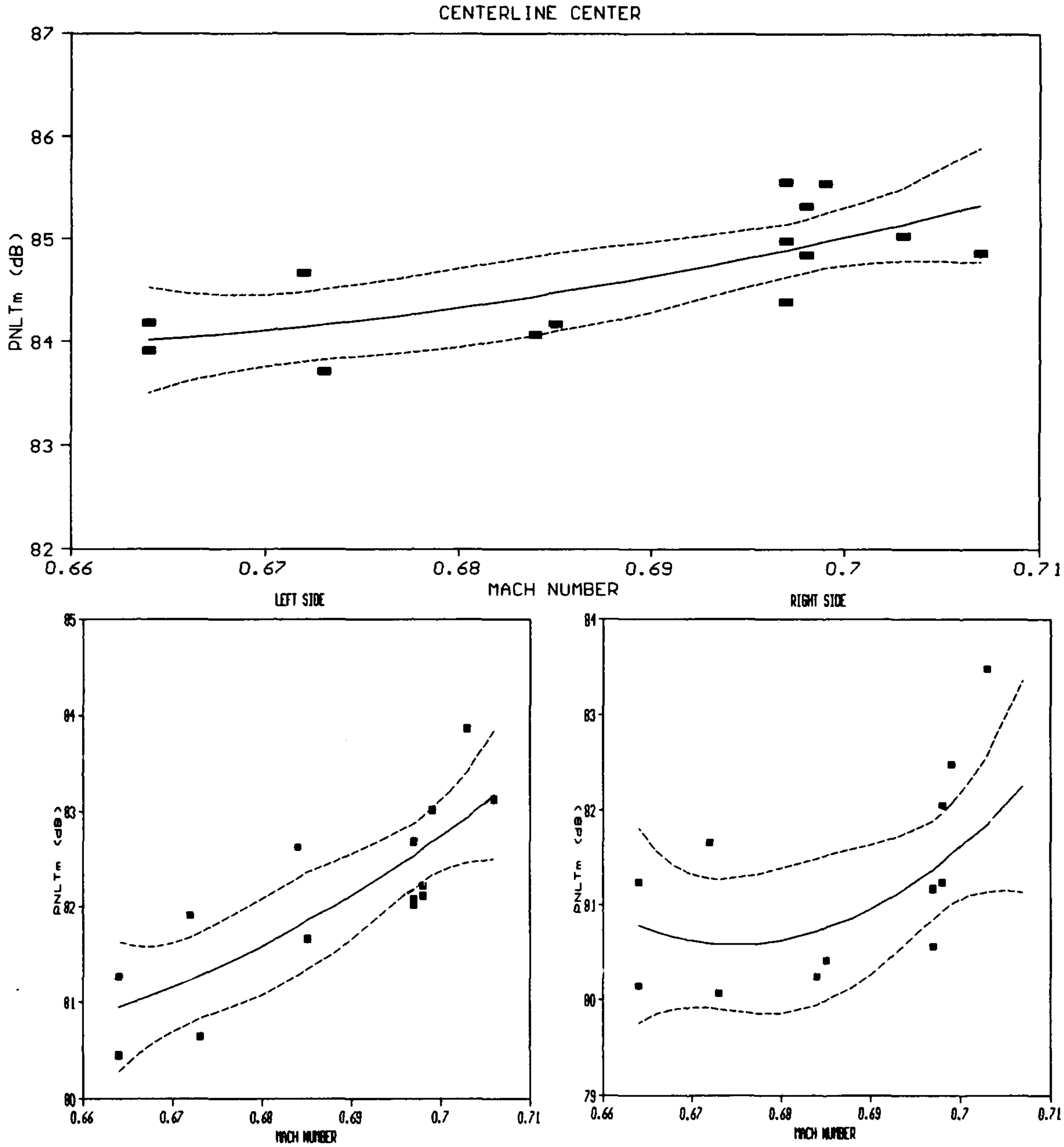

	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$410.0X^2 - 531.4X + 256.2$	.73	.44
LEFT SIDE	$511.8X^2 - 648.6X + 286.0$	.82	.59
RIGHT SIDE	$1632.6X^2 - 2203.7X + 824.3$	.53	.89

FIGURE E-7. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER
SCHWEIZER 300 - CONFIGURATION G
7/25/91

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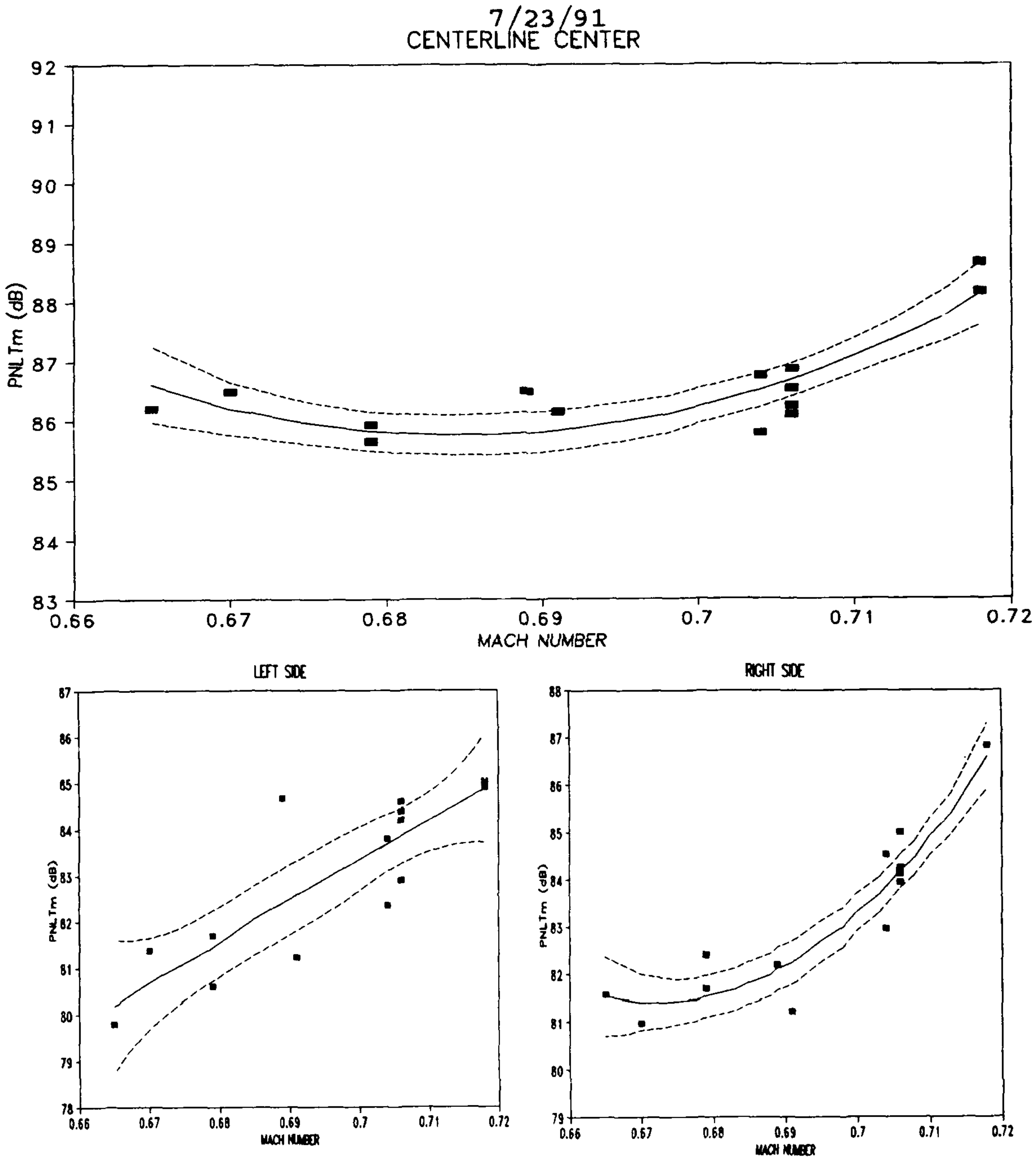

	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$2119.7X^2 +2903.6X +1080.1$	.87	.46
LEFT SIDE	$-152.1X^2 + 298.4X - 51.0$	.84	1.04
RIGHT SIDE	$2425.5X^2 - 3260.1X + 1176.9$	.95	.61

FIGURE E-8. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER SCHWEIZER 330 - CONFIGURATION H 7/23/91

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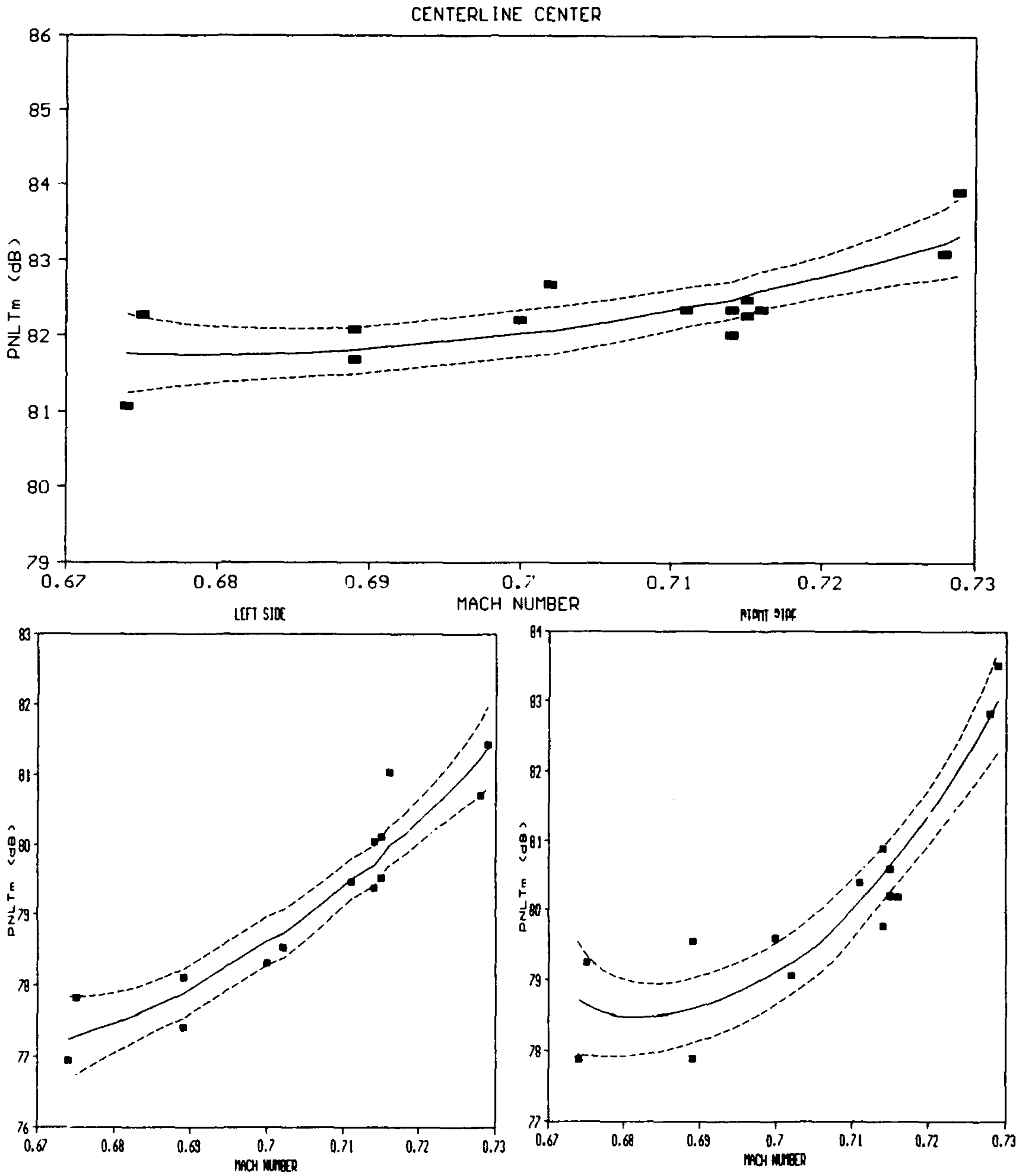

	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$632.7X^2 - 859.7X + 373.8$	.79	.43
LEFT SIDE	$791.9X^2 - 1036.7X + 416.3$	.95	.48
RIGHT SIDE	$2191.8X^2 - 2996.9X + 1102.9$	.93	.62

FIGURE E-9. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER SCHWEIZER 300 - CONFIGURATION I 7/24/91

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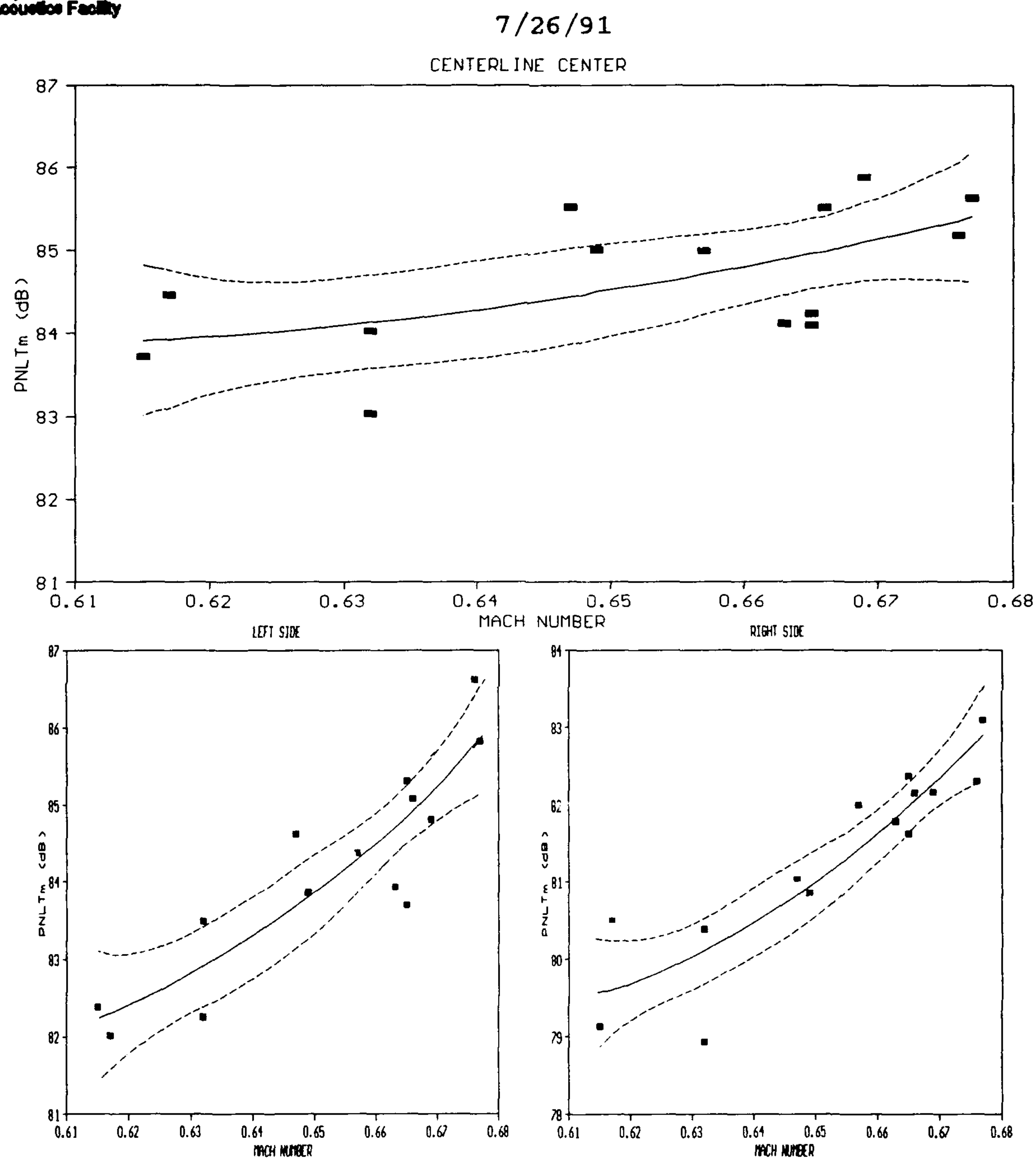
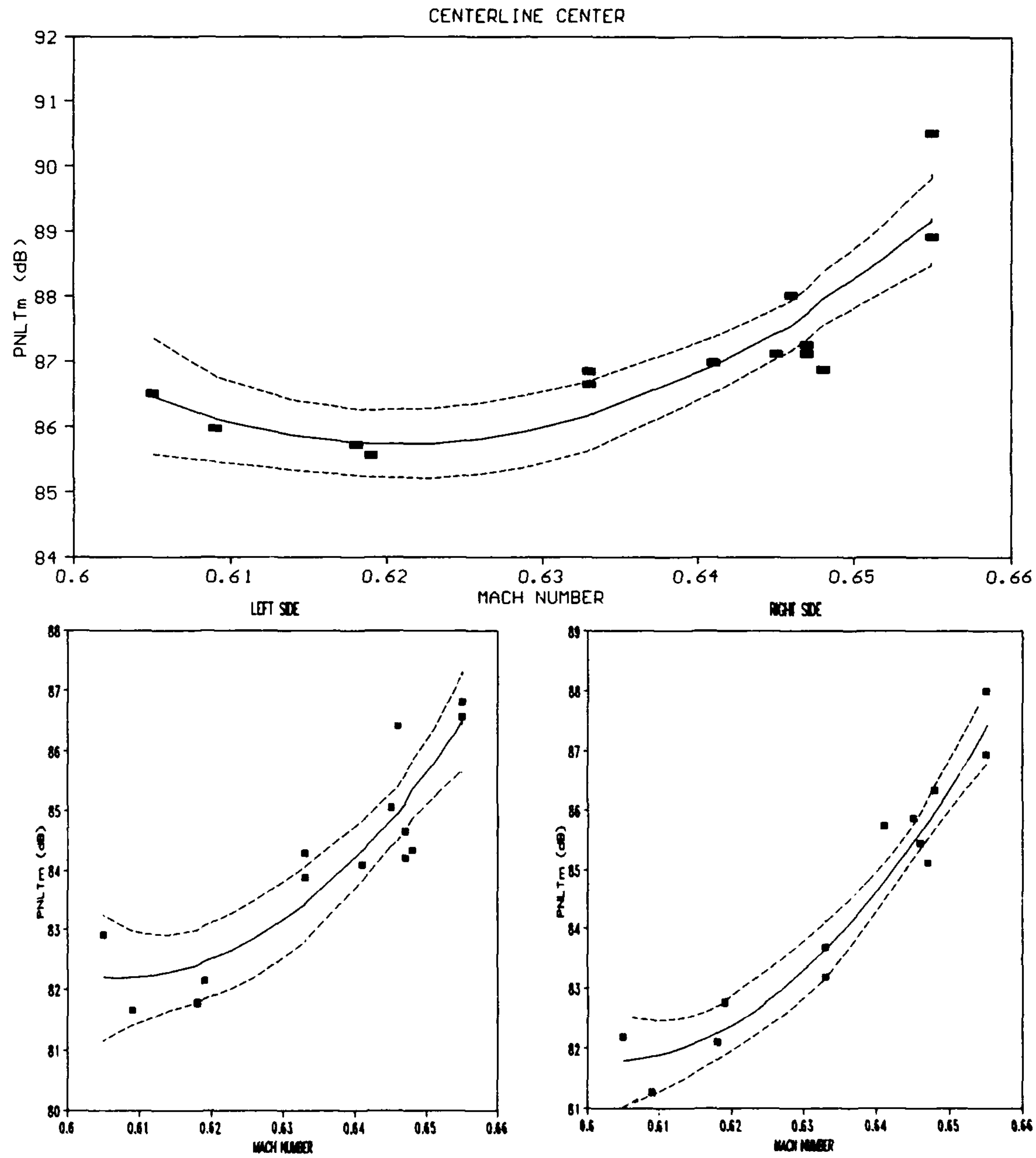


	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$248.4X^2 - 297.1X + 172.7$	.60	.73
LEFT SIDE	$461.6X^2 - 538.5X + 238.9$	.89	.67
RIGHT SIDE	$494.8X^2 - 585.8X + 252.$	.91	.56

FIGURE E-10. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER
ENSTROM 280FX
7/26/91



	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$2959.7X^2 - 3674.9X + 1226.5$	.88	.66
LEFT SIDE	$1885.9X^2 - 2290.8X + 777.8$	.90	.78
RIGHT SIDE	$2063.2X^2 - 2487.5X + 831.5$	.97	.58

FIGURE E-11. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER
ENSTROM TH28
7/26/91

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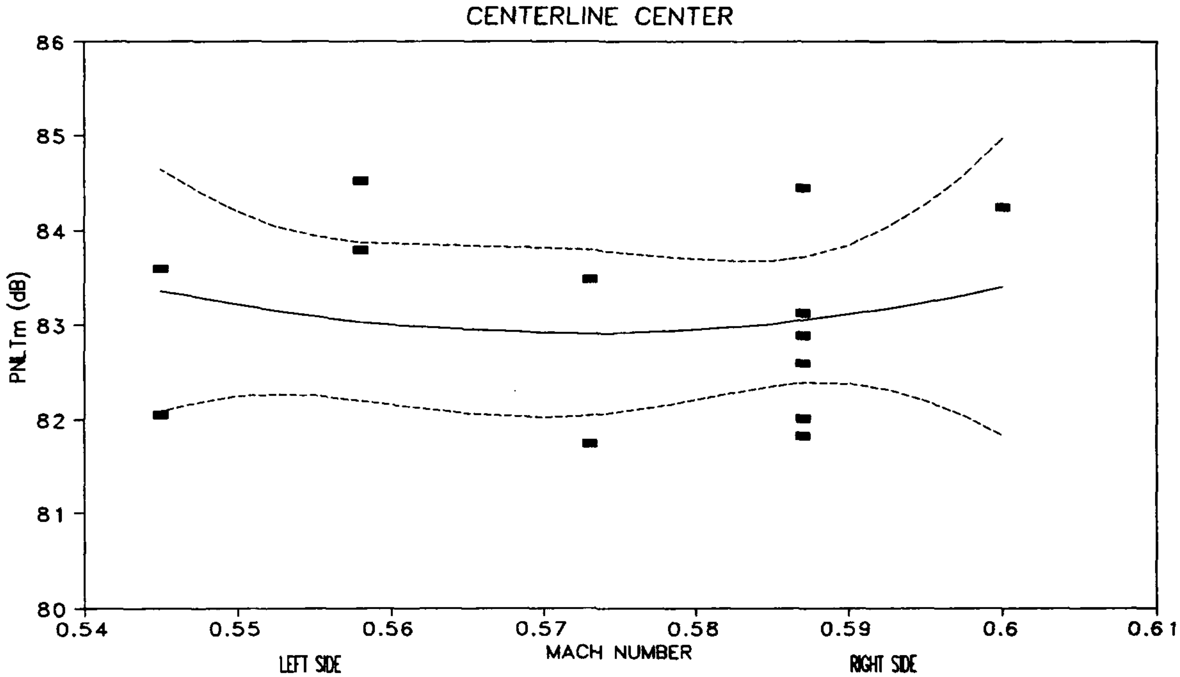

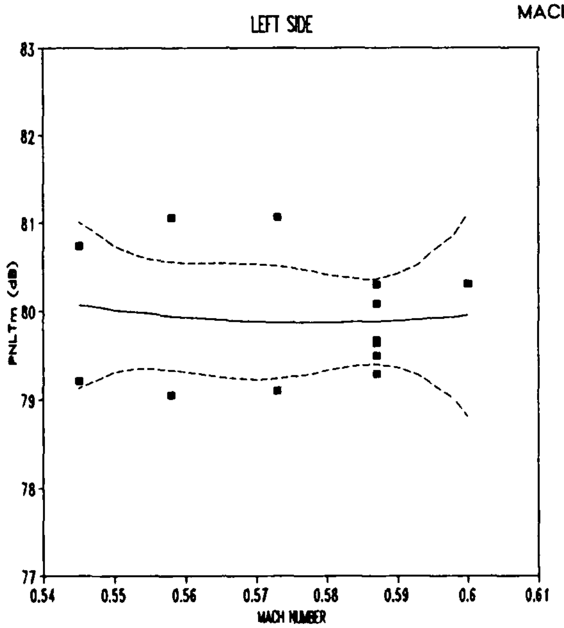

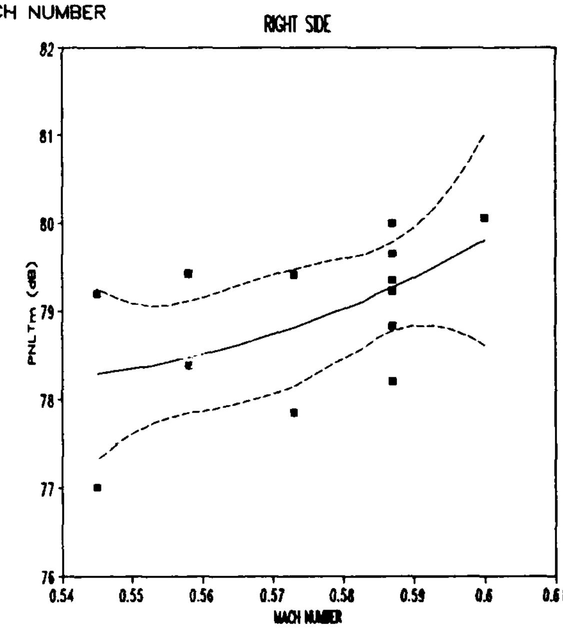

	REGRESSION EQ.	CORR. COEFF.	STD ERROR OF EST.
CENTERLINE	$616.4X^2 - 705.4X + 284.7$	.16	1.09
LEFT SIDE	$185.1X^2 - 214.1X + 141.8$	.10	.79
RIGHT SIDE	$320.0X^2 - 339.0X + 168.0$	.53	.82

FIGURE E-12. $PNLT_{max}$ VS. ADVANCING BLADE TIP MACH NUMBER
ROTORWAY EXEC90
7/22/91

TABLE E-1. PNLTm VS. MACH NUMBER$_{ABT}$ REGRESSION MODEL EQUATIONS

	CENTERLINE				
Helicopter	Reference	Alt. Set 1	Alt. Set 2	Alt. Set 3	Alt. Set 4
Schweizer 300 Configuration A	$978.3X^2-1269.5X+502.0$	$903.8X^2-1169.0X+468.2$	$982.9X^2-1276.2X+504.4$	$799.2X^2-1025.6X+419.1$	$1003.9X^2-1304.8X+514.2$
Schweizer 300 Configuration B	$3027.2X^2-3985.5X+1397.1$	$2966.0X^2-3898.2X+1366.2$	$3016.9X^2-3969.0X+1390.8$	$2604.8X^2-3415.5X+1205.2$	$3056.9X^2-4021.1X+1407.7$
Schweizer 300 Configuration C	$3360.2X^2-4516.0X+1600.7$	$3357.0X^2-4509.3X+1597.6$	$3458.8X^2-4651.7X+1647.3$	$3368.7X^2-4525.4X+1603.2$	$3177.4X^2-4261.7X+1512.4$
Schweizer 300 Configuration D	$1492.1X^2-1971.3X+731.7$	$1917.9X^2-2540.0X+921.5$	$1522.6X^2-2002.2X+738.8$	$2084.4X^2-2772.8X+1002.6$	$1869.8X^2-2474.3X+899.1$
Schweizer 300 Configuration E	$2384.0X^2-3202.3X+1159.6$	$2397.3X^2-3221.4X+1166.4$	$2371.1X^2-3185.1X+1153.8$	$2286.3X^2-3067.7X+1113.3$	$2564.8X^2-3453.0X+1246.4$
Schweizer 300 Configuration F	$932.4X^2-1255.6X+505.0$	$861.4X^2-1157.3X+471.0$	$887.4X^2-1193.4X+483.5$	$675.3X^2-899.6X+381.9$	$1025.1X^2-1384.1X+549.5$
Schweizer 300 Configuration G	$410.0X^2-531.4X+256.2$	$497.1X^2-655.2X+300.0$	$480.3X^2-628.7X+289.7$	$314.7X^2-401.9X+212.1$	$655.3X^2-876.4X+377.1$
Schweizer 330 Configuration H	$2119.7X^2-2903.6X+1080.1$	$1895.4X^2-2588.9X+969.9$	$1852.4X^2-2529.1X+949.1$	$1890.8X^2-2583.0X+968.0$	$1926.4X^2-2631.4X+984.5$
Schweizer 330 Configuration I	$632.7X^2-859.7X+373.8$	$475.9X^2-636.9X+294.8$	$452.0X^2-603.1X+282.9$	$453.4X^2-605.3X+283.7$	$530.0X^2-713.1X+321.6$
Enstrom 280FX	$248.4X^2-297.1X+172.7$	$101.2X^2-105.5X+110.5$	$101.4X^2-107.5X+111.6$	$15.8X^2+11.1X+71.0$	$249.4X^2-301.3X+174.9$
Enstrom TH28	$2959.7X^2-3674.9X+1226.5$	$2970.3X^2-3680.9X+1226.2$	$2828.5X^2-3499.5X+1168.2$	$2999.7X^2-3719.5X+1238.8$	$2875.2X^2-3563.8X+1190.1$
Rotorway Exec90	$616.4X^2-705.4X+284.7$	$534.8X^2-606.9X+255.2$	$624.0X^2-714.6X+287.5$	$471.2X^2-530.4X+232.4$	$495.0X^2-559.1X+241.0$

TABLE E-2. PNLTm VS. MACH NUMBER$_{ABT}$ REGRESSION MODEL EQUATIONS

	LEFT SIDE				
Helicopter	Reference	Alt. Set 1	Alt. Set 2	Alt. Set 3	Alt. Set 4
Schweizer 300 Configuration A	$703.6X^2-878.5X+358.7$	$911.2X^2-1154.0X+450.1$	$963.2X^2-1222.1X+472.3$	$674.1X^2-838.4X+345.1$	$1040.5X^2-1327.3X+508.1$
Schweizer 300 Configuration B	$-198.8X^2+290.3X-23.6$	$-895.6X^2+1217.8X-331.9$	$-874.4X^2+1190.8X-323.4$	$-673.7X^2+924.3X-235.0$	$-1016.3X^2+1378.0X-385.0$
Schweizer 300 Configuration C	$1398.8X^2-1842.4X+686.4$	$1355.2X^2-1780.1X+664.2$	$1313.1X^2-1724.6X+645.9$	$1377.0X^2-1809.6X+674.2$	$1326.9X^2-1740.6X+650.5$
Schweizer 300 Configuration D	$2688.9X^2-3597.3X+1280.8$	$3413.8X^2-4573.2X+1609.1$	$2931.2X^2-3922.8X+1390.1$	$3739.7X^2-5019.5X+1761.6$	$3289.6X^2-4402.9X+1550.8$
Schweizer 300 Configuration E	$2762.5X^2-3714.6X+1329.7$	$2805.9X^2-3776.3X+1351.5$	$2744.4X^2-3690.7X+1321.8$	$2892.4X^2-3896.4X+1393.2$	$2826.1X^2-3803.2X+1360.5$
Schweizer 300 Configuration F	$1048.3X^2-1372.8X+529.1$	$1103.6X^2-1449.4X+555.5$	$1140.8X^2-1501.0X+573.4$	$974.6X^2-1270.9X+493.8$	$1207.8X^2-1593.7X+605.5$
Schweizer 300 Configuration G	$511.8X^2-648.6X+286.0$	$244.2X^2-277.6X+157.6$	$175.1X^2-181.4X+124.2$	$346.5X^2-419.8X+206.9$	$271.3X^2-313.8X+169.7$
Schweizer 330 Configuration H	$-152.1X^2+298.4X-51.0$	$-309.3X^2+517.2X-127.0$	$-261.9X^2+450.3X-103.5$	$-605.7X^2+933.3X-272.8$	$-28.3X^2+124.2X+10.2$
Schweizer 330 Configuration I	$791.9X^2-1036.7X+416.3$	$863.6X^2-1140.2X+453.5$	$941.7X^2-1251.2X+492.8$	$702.1X^2-909.4X+371.2$	$982.7X^2-1310.0X+513.9$
Enstrom 280FX	$461.6X^2-538.5X+238.9$	$400.0X^2-454.6X+210.5$	$227.8X^2-230.1X+137.4$	$269.6X^2-285.5X+155.8$	$545.4X^2-647.6X+274.3$
Enstrom TH28	$1885.9X^2-2290.8X+777.8$	$1989.2X^2-2416.9X+816.3$	$1725.3X^2-2078.4X+708.0$	$1982.0X^2-2410.0X+814.8$	$2023.8X^2-2465.3X+833.0$
Rotorway Exec90	$185.1X^2-214.1X+141.8$	$198.8X^2-230.6X+146.7$	$186.9X^2-216.2X+142.4$	$52.3X^2-54.1X+93.9$	$164.9X^2-189.8X+134.5$

TABLE E-3. PNLTm VS. MACH $NUMBER_{ABT}$ REGRESSION MODEL EQUATIONS

	RIGHT SIDE				
Helicopter	Reference	Alt. Set 1	Alt. Set 2	Alt. Set 3	Alt. Set 4
Schweizer 300 Configuration A	$2573.0X^2-3386.4X+1199.9$	$2682.8X^2-3534.8X+1250.0$	$2615.3X^2-3444.0X+1219.5$	$2398.7X^2-3148.9X+1119.2$	$2924.4X^2-3864.9X+1362.6$
Schweizer 300 Configuration B	$2757.5X^2-3611.2X+1263.4$	$3213.4X^2-4215.3X+1463.4$	$3251.0X^2-4268.4X+1482.1$	$2744.1X^2-3589.9X+1255.2$	$3576.5X^2-4698.0X+1623.7$
Schweizer 300 Configuration C	$1518.0X^2-2011.7X+746.6$	$1438.7X^2-1902.6X+709.2$	$1527.4X^2-2024.7X+751.0$	$1520.5X^2-2015.7X+748.1$	$1272.3X^2-1673.5X+630.4$
Schweizer 300 Configuration D	$4589.1X^2-6101.1X+2103.9$	$4882.1X^2-6484.2X+2229.1$	$4663.8X^2-6182.9X+2125.4$	$4792.5X^2-6376.3X+2196.9$	$4747.0X^2-6300.3X+2166.6$
Schweizer 300 Configuration E	$2403.7X^2-3229.9X+1166.0$	$2419.5X^2-3254.2X+1175.1$	$2602.4X^2-3509.2X+1263.8$	$2298.0X^2-3085.0X+1116.3$	$2362.6X^2-3174.9X+1147.6$
Schweizer 300 Configuration F	$2425.8X^2-3283.4X+1190.4$	$2588.7X^2-3508.8X+1268.4$	$2607.3X^2-3534.6X+1277.3$	$2663.1X^2-3611.9X+1304.0$	$2491.9X^2-3374.8X+1222.1$
Schweizer 300 Configuration G	$1632.6X^2-2203.7X+824.3$	$1410.3X^2-1901.0X+721.2$	$1202.5X^2-1607.7X+618.0$	$1683.7X^2-2281.1X+853.1$	$1520.9X^2-2054.9X+774.7$
Schweizer 330 Configuration H	$2425.5X^2-3260.1X+1176.9$	$2468.5X^2-3321.0X+1198.4$	$2500.6X^2-3365.9X+1214.0$	$2371.9X^2-3185.2X+1150.7$	$2549.4X^2-3434.5X+1238.2$
Schweizer 330 Configuration I	$2191.8X^2-2996.9X+1102.9$	$2097.1X^2-2861.1X+1054.3$	$2122.7X^2-2897.3X+1067.1$	$2031.4X^2-2768.8X+1021.9$	$2118.1X^2-2890.5X+1064.6$
Enstrom 280FX	$494.8X^2-585.8X+252.7$	$608.1X^2-733.1X+300.5$	$532.6X^2-636.4X+269.6$	$659.3X^2-799.8X+322.2$	$623.1X^2-751.8X+306.3$
Enstrom TH28	$2063.2X^2-2487.5X+831.5$	$2310.9X^2-2799.1X+929.5$	$2454.1X^2-2983.8X+988.9$	$2331.7X^2-2826.9X+938.7$	$2018.1X^2-2425.0X+810.2$
Rotorway Exec90	$320.0X^2-339.0X+168.0$	$298.7X^2-313.3X+160.3$	$320.6X^2-339.8X+168.2$	$-470.5X^2+579.1X-98.1$	$389.3X^2-422.5X+193.0$

APPENDIX F

SUMMARY METEOROLOGICAL DATA

This Appendix contains a summary of the meteorological data sources and a plot of temperature and relative humidity vs. time for each day, used for sound level adjustments to reference conditions, Table F-1 and Figures F-1 through F-5.

TABLE F-1. SUMMARY OF METEOROLOGICAL DATA SOURCES

Date	Temperature	Relative Humidity	Wind Speed and Direction
07/22/91	CERL Weather Tower, 35 ft. sensor	Willard Airport ATIS	On-site weather station
07/23/91	CERL Weather Tower, 35 ft. sensor	Willard Airport ATIS	On-site weather station
07/24/91	CERL Weather Tower, 35 ft. sensor	On-site weather station	On-site weather station
07/25/91	CERL Weather Tower, 35 ft. sensor	On-site weather station	On-site weather station
07/26/91	CERL Weather Tower, 35 ft. sensor	On-site weather station	CERL Weather Tower

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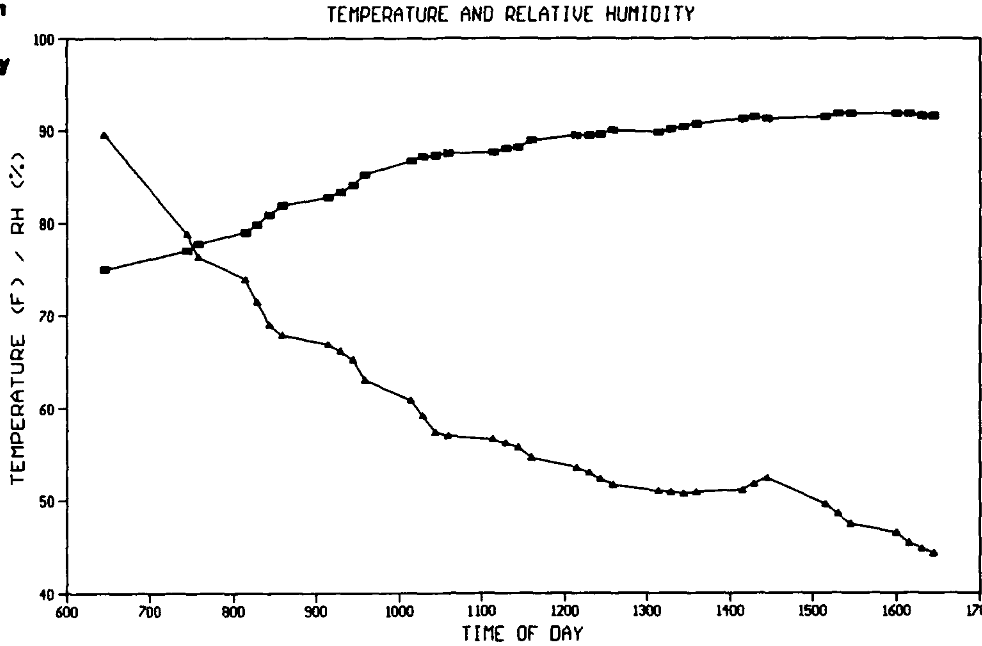

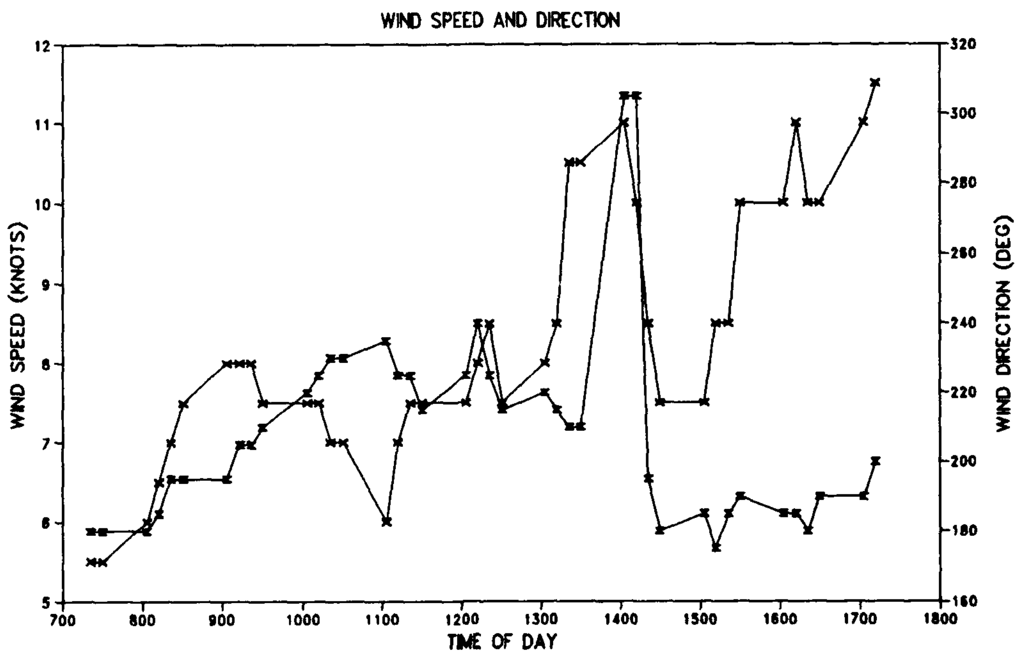

FIGURE F-1. METEROLOGICAL DATA
07/22/91

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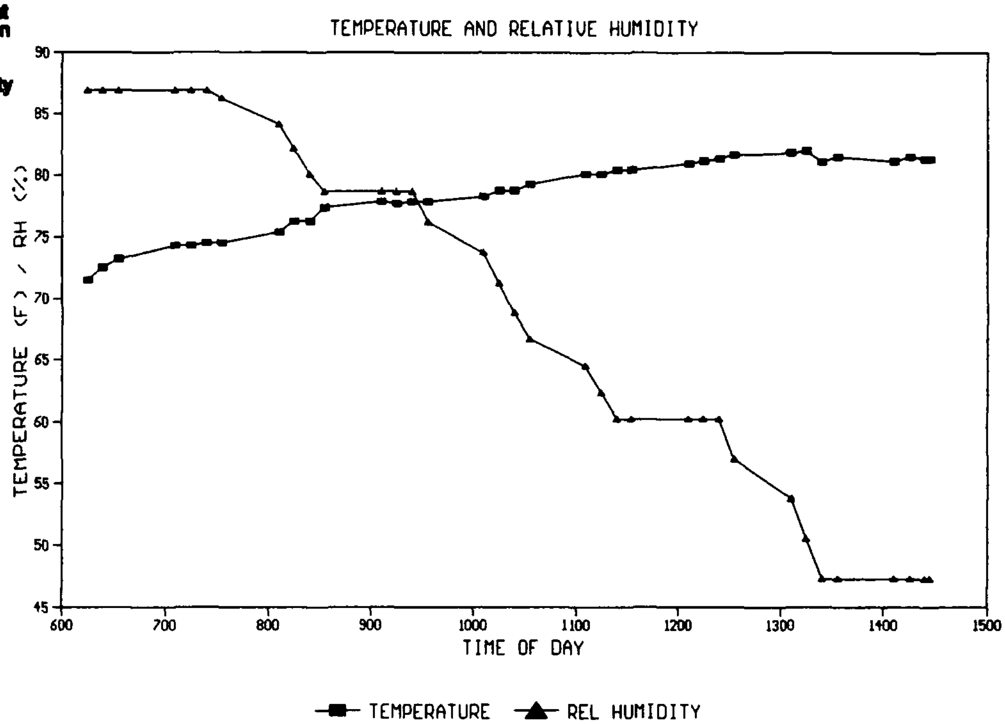

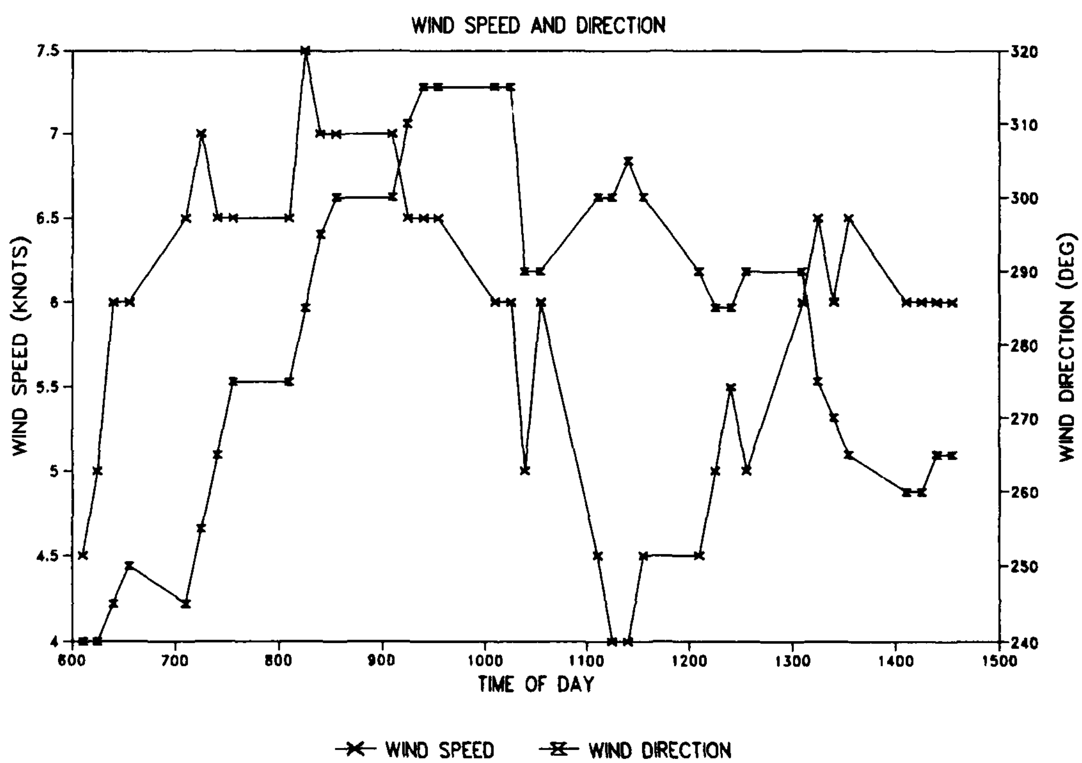

FIGURE F-2. METEROLOGICAL DATA
07/23/91

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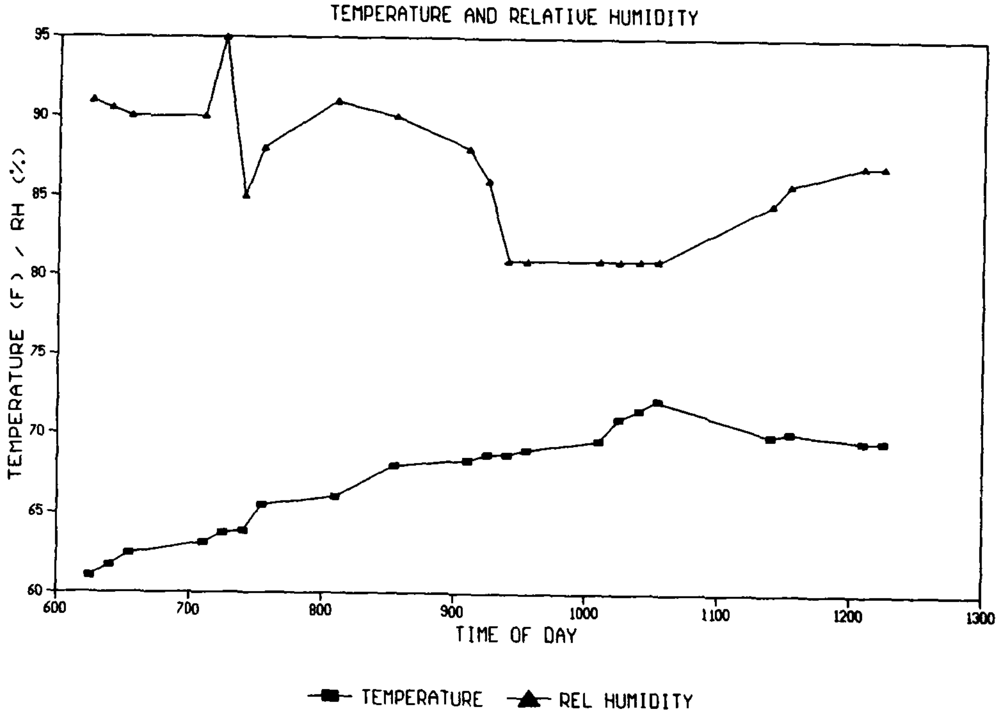


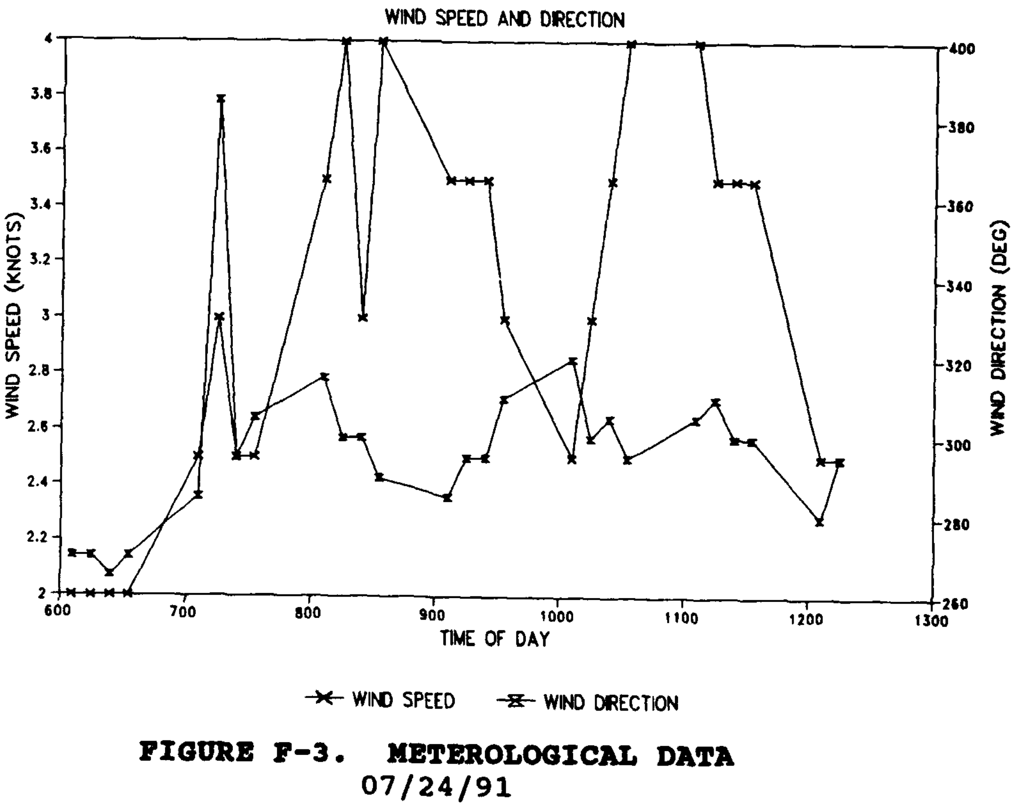
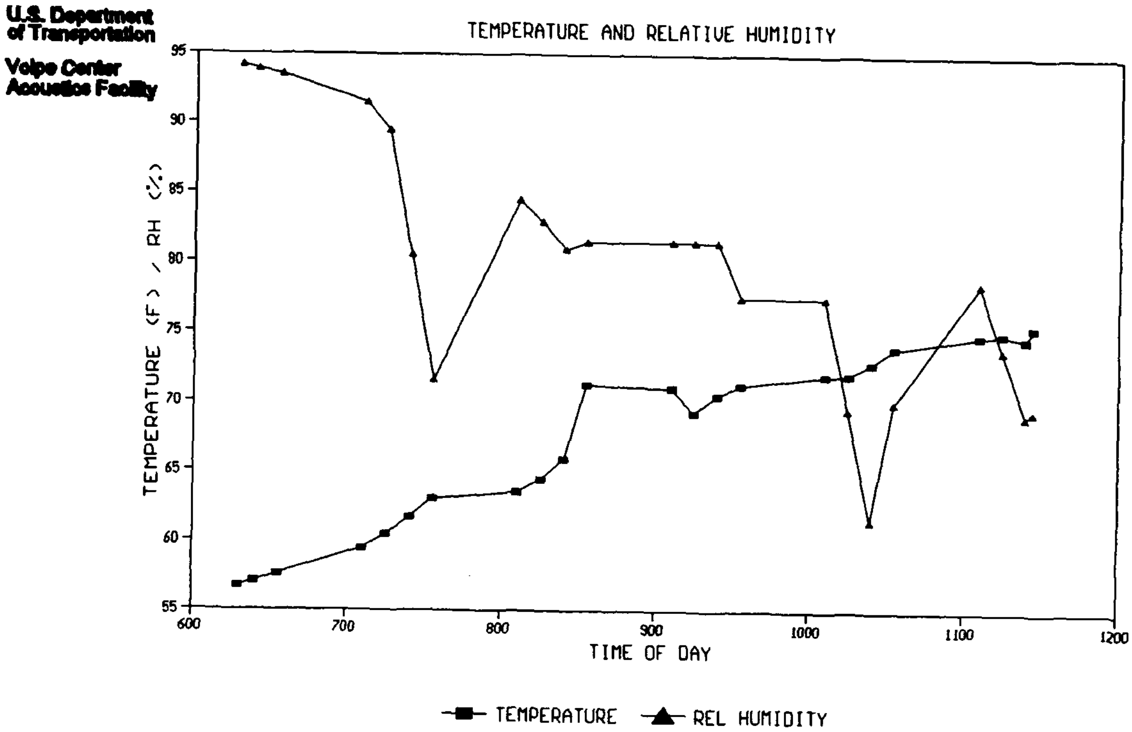


FIGURE F-3. METEROLOGICAL DATA
07/24/91



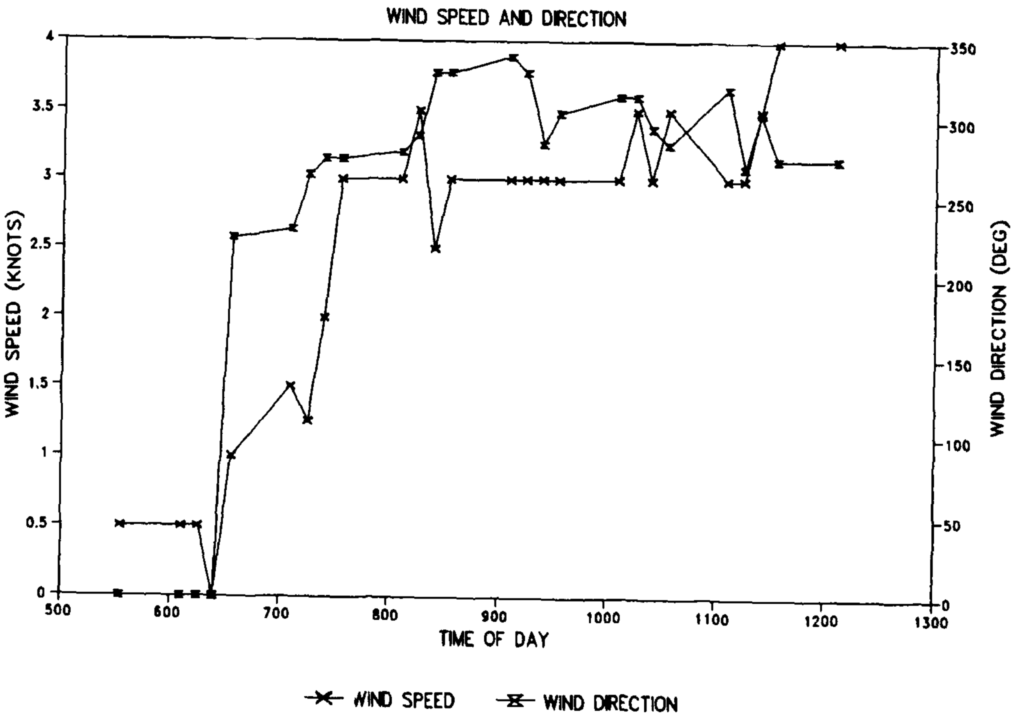


FIGURE F-4. METEROLOGICAL DATA
07/25/91

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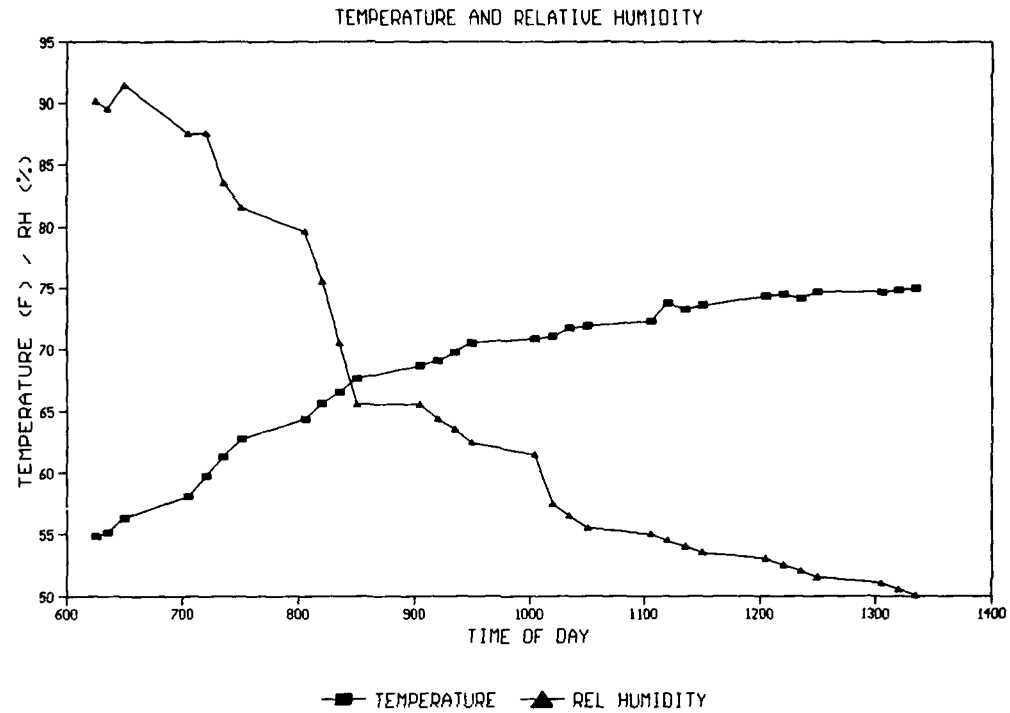

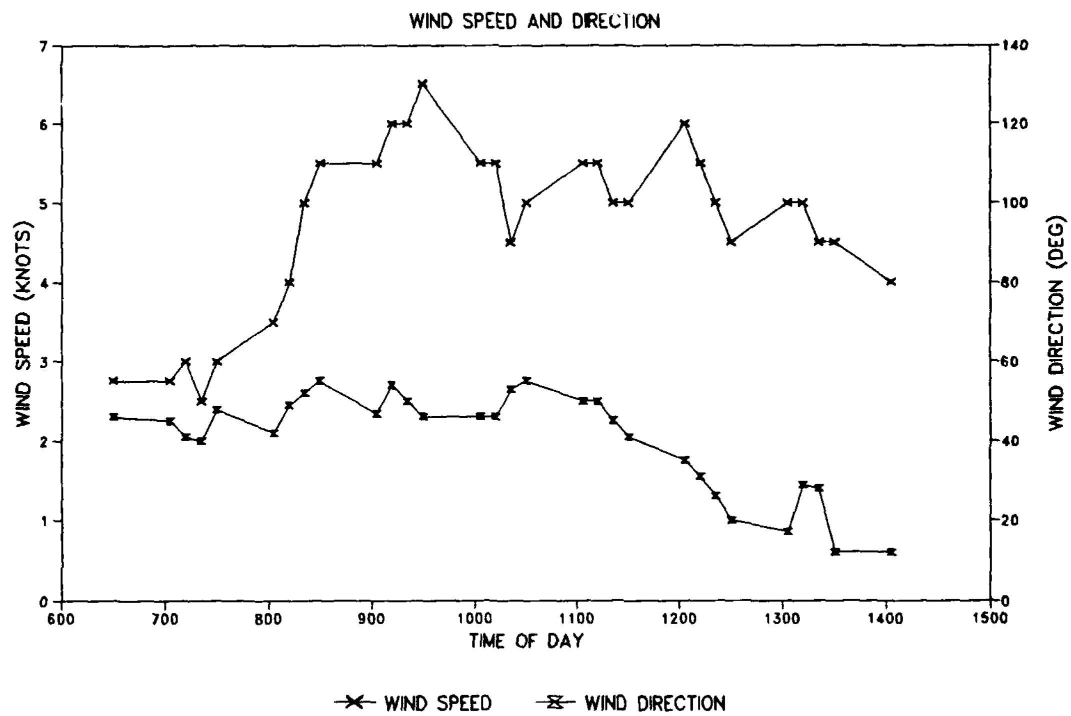

FIGURE F-5. METEROLOGICAL DATA
07/26/91

APPENDIX G

SUMMARY TRACKING DATA

This Appendix contains helicopter tracking data for each test flight, used to calculated sound level adjustments to reference conditions, Tables G-1 through G-12.

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TABLE G-1. SUMMARY HELICOPTER TRACKING DATA
SCHWEIZER 300 CONFIGURATION A
7/22/91

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (kts)
B1	09:41:36	389	-32	34
B2	09:46:14	380	0	35
B3	09:51:18	385	0	38
B4	09:56:01	380	0	38
B5	10:01:01	380	0	38
B6	10:06:56	375	0	39
C1	10:32:18	385	-10	35
C5		393	-2	38
C6	10:55:31	370	2	36
C7	11:00:01	437	1	37
C8	11:04:24	382	15	37
C9	11:08:45	382	11	34
A1	08:18:10	490	-8	64
A2	08:20:27	514	42	84
A3	08:23:20	507	-25	60
A4	08:26:00	505	30	80
A5	08:28:53	504	-33	63
A6	08:31:31	526	31	78
D1	08:34:45	510	-54	70
D2	08:37:34	531	36	85
D5	08:49:08	532	-13	53
D6	08:52:23	519	25	68
D7	09:24:45	520	-44	59
D8	09:28:15	537	30	60
D9	09:33:50	521	12	39
D10	09:38:38	528	63	52

TABLE G-2. SUMMARY HELICOPTER TRACKING DATA
SCHWEIZER 300 CONFIGURATION B
7/22/91

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (kts)
B15	16:08:36	380	13	27
B16	16:13:11	384	19	24
B17	16:17:50	395	12	26
B18	16:22:26	386	3	25
B19	16:27:19	404	25	26
B20	16:32:06	391	10	27
C21	16:36:38	500	26	23
C23	16:45:00	450	14	23
C24	16:49:06	414	14	22
C26	16:57:16	387	10	22
C27	17:01:17	395	13	25
C28	17:05:02	397	18	24
A1	14:58:27	567	-8	61
A2	15:01:52	514	34	80
A3	15:04:54	502	-1	58
A4	15:07:40	512	23	76
A5	15:10:46	528	-8	58
A6	15:13:17	524	30	91
D7	15:16:29	531	13	70
D8	15:18:54	499	24	88
D9	9:33:46	522	7	52
D10	15:24:30	500	28	80
D11	15:28:01	525	9	44
D12	15:31:02	511	32	70
D13	15:35:16	510	22	33
D14	15:38:18	484	24	61

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TABLE G-3. SUMMARY HELICOPTER TRACKING DATA
SCHWEIZER 300 CONFIGURATION C
7/23/91

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (kts)
B18	07:49:55	389	10	53
B20	07:57:03	370	13	51
B21	08:00:45	384	13	52
B22	08:04:05	380	6	53
B23		371	9	55
B24	08:10:57	372	11	56
C25	08:14:19	378	21	58
C26	08:18:47	405	8	50
C27	08:21:49	365	15	48
C28	08:25:07	342	16	54
C29	08:28:32	378	0	52
C30	08:32:03	321	14	50
A1	06:40:54	541	6	61
A2	06:43:24	537	36	63
A3	06:45:36	553	-11	81
A4	06:48:09	520	21	63
A5	06:50:38	532	-14	86
A7	06:57:13	517	20	62
D8	06:59:18	552	2	86
D9	07:01:57	515	15	75
D10	07:04:04	541	6	72
D11	07:06:57	535	42	55
D12	07:09:30	549	8	68
D13	07:12:48	552	21	50
D14	07:15:20	549	4	57
D16	07:23:53	540	49	39

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TABLE G-4. SUMMARY HELICOPTER TRACKING DATA
SCHWEIZER 300 CONFIGURATION D
7/23/91

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (kts)
B16	13:49:57	402	15	46
B17	13:53:48	406	18	50
B18	13:57:36	405	9	50
B20	14:05:37	400	2	51
B21	14:09:34	410	10	43
B22	14:13:33	420	18	50
C24	14:21:14	358	0	42
C25	14:25:01	360	0	43
C26	14:28:27	359	16	46
C27	14:32:06	368	29	38
C28	14:36:03	363	32	39
C29	14:39:35	412	26	40
A1	12:41:53	534	37	81
A2	12:44:35	507	13	68
A3	12:46:57	536	5	81
A4	12:49:34	559	22	72
A5	12:51:35	536	-5	84
A6	12:54:20	542	-5	66
D7	12:58:22	536	-11	89
D9	13:03:54	523	27	69
D10	13:06:39	521	8	77
D11	13:09:36	540	21	59
D12	13:12:19	527	1	66
D13	13:15:39	522	-2	51
D14	13:18:26	525	21	59
D15	13:22:16	531	4	45

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TABLE G-5. SUMMARY HELICOPTER TRACKING DATA SCHWEIZER 300 CONFIGURATION E 7/24/91

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (ft)
B15	07:36:20	404	7	54
B16	07:40:09	379	21	55
B17	07:44:15	385	-13	57
B18	07:48:19	394	13	55
B19	07:52:33	394	0	52
B20	07:56:25	400	30	50
E1	11:44:28	431	11	46
E2	11:48:27	414	8	43
E3	11:52:24	445	9	41
E5	12:00:29	422	9	42
E6	12:04:24	453	4	42
E7	12:08:25	412	10	42
A1	09:08:02	528	6	84
A2	09:10:46	519	-8	64
A3	09:15:04	512	-11	64
A4	09:20:28	514	6	65
A5	09:22:27	505	-14	88
A6	09:25:20	500	0	62
D7	09:27:34	522	0	93
D8	09:30:14	510	0	72
D9	09:34:26	528	-6	77
D10	09:37:21	520	1	57
D11	09:39:42	524	-1	71
D12	09:42:29	505	-9	47
D13	09:45:14	538	0	66
D14	09:48:51	531	-21	39

TABLE G-6. SUMMARY HELICOPTER TRACKING DATA
SCHWEIZER 300 CONFIGURATION F
7/25/91

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (kts)
B16	07:51:04	401	16	51
B17	07:55:05	399	16	48
B18	07:58:50	388	15	51
B20	08:10:60	381	-10	48
B21	08:14:59	392	20	48
B22	08:18:58	379	18	48
B23	08:22:31	396	9	49
C24	08:25:57	360	12	41
C25	08:29:20	443	0	44
C26	08:32:24	403	10	39
C28	08:39:02	358	8	43
C29	08:42:16	398	0	42
C30	08:45:20	396	0	43
C31	08:48:16	377	0	39
A1	06:39:35	500	28	81
A2	06:42:50	514	17	57
A3	06:45:47	502	0	79
A4	06:48:37	512	31	57
A6	06:54:29	519	23	57
A7	06:58:30	529	-2	77
D8	07:01:22	520	34	64
D9	07:03:46	512	6	86
D10	07:09:24	539	29	51
D11	07:12:28	512	-6	74
D12	07:16:20	523	35	43
D13	07:18:53	495	21	67
D14	07:22:35	531	16	35
D15	07:25:20	526	18	58

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TABLE G-7. SUMMARY HELICOPTER TRACKING DATA
SCHWEIZER 300 CONFIGURATION G
7/25/91

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (kts)
B16	10:47:47	403	0	47
B17	10:51:46	385	0	46
B19	10:59:11	392	7	48
B20	11:02:55	372	6	49
B21	11:06:18	393	0	48
B24	11:18:36	388	-1	44
C25	11:21:59	340	10	42
C26	11:25:23	445	0	43
C27	11:28:52	424	0	41
C28	11:34:59	389	0	44
C29	11:38:20	464	12	42
C30	11:43:56	374	10	40
A2	9:44:47	503	-1	68
A3	9:47:18	496	1	77
A4	9:50:06	489	1	66
A5	9:52:36	518	-5	78
A6	9:55:30	507	-8	66
A7	9:57:57	494	0	80
D8	10:01:22	491	-3	73
D9	10:04:20	523	1	86
D10	10:07:14	500	-1	59
D11	10:09:48	489	-8	68
D12	10:12:43	476	-21	49
D13	10:15:21	497	-13	61
D14	10:18:45	507	20	44
D15	10:21:43	498	-10	54

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**TABLE G-8. SUMMARY HELICOPTER TRACKING DATA
SCHWEIZER 330 CONFIGURATION H
7/23/91**

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (kts)
B17	10:27:59	376	-22	61
B18	10:31:18	382	0	60
B19	10:34:25	377	-27	60
B20	10:41:18	404	-11	59
B21	10:44:26	397	-29	59
B22	10:47:48	372	-6	58
C29	11:44:11	465	-10	59
C30	11:47:30	569	-13	56
C31	11:50:50	532	-19	55
C32	11:53:54	508	-18	57
C33	11:57:04	469	-19	57
C34	12:00:30	471	-10	57
A1	09:28:07	446	-15	100
A2	09:30:35	431	23	72
A3	09:32:48	438	-35	103
A5	09:39:26	421	4	77
A6	09:41:18	435	-25	99
A7	09:43:55	457	18	75
D8	09:45:52	422	-26	111
D9	09:48:11	412	50	88
D10	09:50:19	476	-39	90
D11	09:54:25	435	27	66
D12	09:56:14	483	-65	79
D13	09:58:48	461	18	56
D14	10:00:48	460	-26	70
D15	10:03:55	491	17	52

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TABLE G-9. SUMMARY HELICOPTER TRACKING DATA
SCHWEIZER 330 CONFIGURATION I
7/24/91

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (kts)
B16	10:10:52	386	-31	53
B17	10:14:09	384	-27	55
B18	10:17:34	368	-21	52
B19	10:20:57	373	-20	53
B20	10:26:18	382	-21	56
B21	10:31:09	402	-35	52
C22	10:34:11	494	-12	56
C23	10:37:31	508	-22	55
C24	10:41:29	483	-20	56
C25	10:45:05	504	-14	54
C26	10:48:37	477	-8	56
C27	10:53:42	524	-9	59
A1	09:08:02	413	-28	89
A2	09:10:46	435	-22	79
A3	09:15:04	432	-30	91
A4	09:20:28	425	23	76
A5	09:22:27	437	-36	93
A6	09:25:20	419	26	80
D7	09:27:34	412	-27	101
D8	09:30:14	409	29	91
D9	09:34:26	436	-26	78
D10	09:37:21	437	24	67
D11	09:39:42	461	-32	71
D12	09:42:29	462	27	59
D13	09:45:14	473	-23	62
D14	09:48:51	445	22	50

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TABLE G-10. SUMMARY HELICOPTER TRACKING DATA
ENSTROM 280FX CONFIGURATION J
7/26/91

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (KTS)
BP9	07:12:58	384	-2	62
BP10	07:17:21	379	-20	61
BP11	07:22:02	406	-11	62
BP12	07:26:39	383	-23	62
BP13	07:13:28	371	18	61
BP14	07:36:15	378	-14	62
CP22	08:44:04	446	-23	60
CP23	08:48:58	421	7	61
CP24	08:53:48	433	20	58
CP25	08:58:25	432	17	56
CP26	09:03:43	422	0	57
CP27	09:08:52	428	-11	59
AP42	12:46:55	509	5	101
AP43	12:50:04	503	-15	79
AP44	12:52:44	509	16	106
AP45	12:55:43	509	13	85
AP46	12:57:57	528	0	101
AP47	13:30:32	528	13	81
DP48	13:03:18	504	9	108
DP49	13:06:40	510	12	85
DP51	13:13:49	505	-4	94
DP52	13:17:31	484	-11	74
DP53	13:21:39	502	9	81
DP54	13:25:36	494	11	65
DP55	13:29:34	526	29	74
DP57	13:39:38	475	0	54

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TABLE G-11. SUMMARY HELICOPTER TRACKING DATA
ENSTROM TH28 CONFIGURATION K
7/26/91

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (kts)
BT1	06:28:02	416	-37	62
BT2	06:32:23	370	-27	65
BT4	06:41:34	403	-22	62
BT5	06:46:15	408	-28	64
BT6	06:50:51	385	-32	64
BT7	06:55:16	375	-22	64
CT16	80:02:22	415	-25	61
CT17	08:07:00	445	-13	60
CT18	08:11:33	452	-37	61
CT19	08:16:54	448	-34	59
CT20	08:23:57	437	-19	57
CT21	08:28:15	456	-31	62
AT28	10:15:25	487	-49	93
AT29	10:18:05	495	19	82
AT30	10:20:39	464	-33	99
AT31	10:25:27	494	11	85
AT32	10:28:35	480	-12	97
AT33	10:33:04	518	12	88
DT34	10:35:29	477	-49	103
DT35	10:38:14	465	30	94
DT36	10:40:44	507	-11	89
DT37	10:46:19	489	-1	74
DT38	10:50:20	509	-14	79
DT39	10:53:35	522	-11	62
DT40	10:59:42	568	-27	69
DT41	11:05:50	469	-24	53

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TABLE G-12. SUMMARY HELICOPTER TRACKING DATA
ROTORWAY
7/22/91

EVENT	OVERHEAD TIME OF DAY	ALTITUDE (ft)	LATERAL DEVIATION (ft)	GROUND SPEED (kts)
B15	12:42:42	385	20	54
B16	12:46:58	387	21	53
B17	12:51:32	386	13	51
B18	12:56:42	358	34	46
B19	13:38:45	380	18	45
B20	13:43:47	366	31	48
B21	13:48:06	375	16	41
C22	13:52:54	185	0	45
C23	13:56:30	180	0	47
C24	14:03:10	180	0	44
C25	14:10:21	190	0	46
C26	14:14:21	180	0	48
C27	14:18:03	205	0	41
A1	11:40:29	465	0	74
A2	11:43:01	441	0	83
A3	11:44:57	463	0	74
A4	11:47:16	420	10	83
A5	11:49:29	470	-20	72
A9	12:24:32	470	12	76
A6	11:51:40	416	10	83
A8	11:55:57	420	21	74
A10	12:26:54	498	0	61
A11	12:29:37	485	32	61
A12	12:32:09	529	0	56
A13	12:34:60	509	34	61
A14	12:37:37	533	28	65

GLOSSARY

ATIS	Automated Terminal Information Service
BPF	Blade-Passage Frequency
CCC	Central Command Center
CERL	Construction Engineering Research Laboratory
CPA	Closest Point of Approach
CPAR	Closest Point of Approach Reference
EPNL	Effective Perceived Noise Level
FAA	Federal Aviation Administration
GLR	Graphic Level Recorder
ICAO	International Civil Aviation Organization
OASPL	Overall Sound Pressure Level
PLASI	Pulsed Light Approach Slope Indicator
PNL	Perceived Noise Level
PNLT	Tone-Corrected Perceived Noise Level
RSPA	Research and Special Programs Administration
SEL	Sound Exposure Level
SLM	Sound Level Meter
TCG	Time Code Generator
U.S. DOT	U.S. Department of Transportation
VCR	Video Cassette Recorder

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